WATER RESOURCES

HEARINGS

BEFORE THE

SELECT COMMITTEE ON NATIONAL WATER RESOURCES

UNITED STATES SENATE

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WATER RESOURCES

TUESDAY, DECEMBER 1, 1959

U.S. SENATE,
SELECT COMMITTEE ON NATIONAL WATER RESOURCES,
Alexandria, La.

The select committee met at 9 a.m., pursuant to Senate Resolution 48, in the Bentley Hotel, Senator Robert S. Kerr (chairman) presiding.

Present: Senators Kerr (presiding), Ellender, and Hart.

Present also: Theodore M. Schad, staff director of the select committee, and Paul McBride, chief clerk.

The CHAIRMAN. We are very happy to be in Louisiana.

Our committee is charged with the job of making the best study that we possibly can of the water needs of our country for the next two decades. We hope to bring back to the Senate a summary of those needs, plus some recommendations as to the means whereby they can best be met.

Events move forward oftentimes without our knowledge, and most of the times without our having anything to do with them directly.

One of those categories of events that is of the greatest importance to our country is the rapid increase in population now taking place. It has taken us over 352 years to become a nation of 178 or 180 million. I am not right sure that we have adequately prepared ourselves for a population of that size.

We have had a long time in which to do it.

The Census Bureau experts tell us that within 40 years we are going to double that population, and we sure haven't got another 352 years to get ready for twice as many people as we have today.

Industrial engineers and forecasters tell us that within 20 to 25 years our gross national production will double, and it is now very close to the rate of $500 billion a year.

This tremendous increase in population that will occur, this tremendous increase in agricultural and industrial production which is ahead of us, add up to a great responsibility, but at the same time present the finest opportunity to communities and States and areas which are alert to prepare for that situation that has ever existed in any nation in the history of the world.

That agricultural production and the tremendous industrial workshops that will bring about this doubling of the industrial production are going to occur in the areas that are prepared for it, and the primary element necessary for that opportunity to be available to any State or community or area is water, an abundance of water. Municipalities, domestic use, industrial use, transportation—all must have an adequate supply.

Louisiana is most fortunately situated in that regard because of the fact that I believe you have more oil and gas—energy fuel—than any other State of your size in the Nation. Water and energy fuel are the basis of industrial civilization.

We are glad to be here. This is the 19th hearing of this kind that we have conducted. We are getting reports in detail from every State in the Union in an effort to be able to present to the Senate the sum total of the needs of the 50 States as they have been given to us by the Governors, the water resources boards, the congressional representatives, and the civic organizations in the several States.

When we add up the sum total of the needs of the States, then we will have the answer to the question: "What will the Nation's needs be?"

I am happy that our colleague, Senator Hart from Michigan is here. We had a fine hearing in his State. Many were surprised to learn that one of the great industrial States in the Union, one of the States most abundantly blessed with water, feels itself in a pinch, occasioned by the realization that their industrial growth is now moving forward at a rate greater than their program of conserving water to have it available to meet the needs of that increasing growth.

Senator Hart, do you have anything to say to this distinguished group of people here?

Senator HART. I have only to report that I am a freshman member of Senator Ellender's Committee on Agriculture, and, if you are intensely proud of him, I can understand it readily, although he is a very severe taskmaster. Thank you.

The CHAIRMAN. He's not so tough, Phil. That is just an act.

Now, I am very happy to turn this microphone over to one of the dearest friends I have in the Senate, your own great senior Senator, who will make such statement as he cares to and then call on whomever he feels should make the opening statement and present the witnesses for this hearing.

Senator Ellender.

STATEMENT OF HON. ALLEN J. ELLENDER, U.S. SENATOR FROM THE STATE OF LOUISIANA

Senator ELLENDER. Thank you very much, Senator Kerr. I am very glad to be here this morning and I want to assure all present that they will have a chance to place in the record, if time does not permit the full reading of all statements, such statements as may assist the committee in carrying out the purposes for which it was organized.

I am not going to take too much time, Senator Kerr, in extolling the virtues of you and my good friend, Phil Hart, but I do know from experience that both of you are intensely interested in the protection and preservation of our two most important resources, that is, water and soil.

Here in Louisiana, the State department of public works is the planning agency of the State government and as such is charged with the responsibility of coordinating the water resources development program of the State. It acts as the liaison agency between local agencies and the State government and also between the State government and agencies of the Federal Government engaged in similar work.

The department of public works has been in existence since 1942 and, prior to that, beginning in 1879, the State board of engineers had this responsibility. Since the department of public works has this responsibility in Louisiana, the committee requested the department through its director, Mr. Lorris M. Wimberly, to coordinate this hearing here today. I have known Mr. Wimberly over 30 years now. He has been a director of the department for over 3½ years, and I wish to say that Mr. Wimberly will proceed and make a general statement and thereafter he will call on certain witnesses who have prepared statements to make their detailed presentations.

I want to repeat that, although this committee will sit in Alexandria only today, everyone present who desires to file a statement will be given the opportunity to do so.

The hearings will not be printed immediately and sufficient time will be allowed those who desire to do so to file written statements later.

The CHAIRMAN. That is correct.

Senator ELLENDER. Has any definite date been established or suggested by the committee, Senator?

The CHAIRMAN. No. But you tell us what time you would like to have reserved—say, the first of the year?

Senator ELLENDER. Let us say the 15th of January.

The CHAIRMAN. Fine.

Senator ELLENDER. That will be a good date to give ample opportunity to those who may present a short statement today to further augment such statements. Personally, I think these hearings will bring out quite a lot of facts that will be pertinent for us in the Senate and will act to serve as a guideline for the future.

Now, Mr. Wimberly, you may proceed and make your general statement, sir.

STATEMENT OF LORRIS M. WIMBERLY, DIRECTOR, LOUISIANA STATE DEPARTMENT OF PUBLIC WORKS

Mr. WIMBERLY. Mr. Chairman, members of the committee, I am Lorris M. Wimberly, director of public works for the State of Louisiana.

We are most fortunate in having this opportunity to acquaint you firsthand with the water problems that now confront Louisiana and which are certain to become more acute over the next 20 years.

Due to our responsibility for coordinating water resources development in Louisiana, the committee requested that the department of public works coordinate this hearing here today to see that all interests that desired to be heard were included among the witnesses, to eliminate as much repetition of testimony as possible, and at the same time to keep the length of the hearing within a reasonable time. We have attempted to do this.

I will make a brief general statement with reference to our situation in Louisiana, and then introduce witnesses to give details of the various interests in Louisiana and their problems.

Louisiana's water problems are far greater and more complicated than those ordinarily found throughout the United States. The reason for this is the fact that, in addition to the ordinary problems of

drainage, water supply, irrigation, and navigation, we have the additional problems of flood control, navigation, and salt water intrusion from the gulf.

Louisiana started to work on the solution of its water problems in 1717 when Sieur de Bienville built the first levee in New Orleans. For the next 200 years, until 1917, the property holders built all of their levees and it was not until 1927 that the Federal Government really undertook to protect Louisiana from floods. Since 1886, the State of Louisiana and its agencies have spent over $300 million on flood control, drainage, and water resources projects, which sum if converted to present-day prices would amount to over $1 billion. During the same period the Federal Government has expended approximately $400 million in the State. At the present time, in the neighborhood of $12 million is being spent each year by the State of Louisiana and its agencies for these purposes.

The expense of maintaining the vast flood control system which is required to protect Louisiana from flooding has become so great that local interests have little or no money left to make cash contributions to Federal projects.

Louisiana has over 2,000 miles of levees, approximately 7,000 miles of drainage channels, and some bank stabilization on tributary streams to maintain.

Flood control is Louisiana's major problem. Over 16,000 square miles, more than one-third of the State, are subject to flooding from water which drains from 31 States and 2 Canadian Provinces through Louisiana into the Gulf of Mexico. Paradoxically, only an infinitesimal portion of Louisiana drains into the Mississippi while 3,900 square miles or 2,500,000 acres of the State are devoted to floodways and storage of floodwaters which originate beyond our borders.

In this one-third of the State protected by levees live almost three-fourths of the State's people (2,270,000) and from this one-third comes over three-fourths of Louisiana's disposable income. So attractive is this vital one-third that industry has expended over $2 billion on the Mississippi River from Baton Rouge to the gulf alone.

This vast investment behind these levees makes the responsibility of constructing and maintaining flood control works all the more essential and important. The justification for Federal expenditures for these purposes is increased due to the large increase in Federal taxes collected as a result of the growth and expansion made possible by the construction of such protection. That flood control has proven to be a wise investment in Louisiana is illustrated by the fact that $2 billion in benefits have accrued from the $400 million expended by the Federal Government in our State for this purpose. Much more benefit in savings could be realized if the Federal Government could speed up its construction program. Too much time elapses between the authorization of the project and its completion. To illustrate this, I would like to use the Red River basin in Louisiana as an example.

The overall flood control plan for this basin was authorized in 1946, right after the disastrous 1945 flood. To date, only two of the six authorized upstream reservoirs have been built due to the reluctance to budget enough money to complete a project in a reasonable length of time. Flood damage in the Red River basin in Louisiana has amounted to $30 million in the past 15 years, or $4,150,000 average

annual flood loss. We have lost over 60,000 acres of fertile land to the caving of the Red River banks over the past 25 years of record, or an average annual loss of 2,300 acres. Due to the increasing values of land and need for lands of this type due to increasing population in the United States and the world, this loss cannot be estimated since this land can never be replaced.

The importance of accelerating this flood control work is illustrated by the enormous flood damages which occurred in the Red River basin in the 1957 and 1958 floods. In these 2 years alone the estimated damage losses were $18 million. Almost 400,000 acres of land in this basin were inundated in each of these floods. These damages would not have occurred had the project been completed.

This brief résumé of fact, I believe, shows the overwhelming importance of flood control in the economic life of Louisiana.

While Louisiana's water supply is probably the most abundant of any State in the Nation, the problems associated with distribution, pollution, and periodic droughts are equally as great. Louisiana uses more water than any other Southern State except Texas—we have some 600,000 acres under irrigation—more than any State outside of the arid West.

Today, total rural, municipal, industrial, and agricultural use of water in Louisiana amounts to 5,400 million gallons per day, and is expected to increase to 7,500 million gallons per day by 1980. Twenty-five percent of the water we use is consumed—that is, it is not returned to the stream.

Our principal problem concerns distribution of existing water supplies, both with respect to geography and time. In one season we have too much, in another too little, an abundance in one area, a shortage somewhere else.

All of our coastal streams are subject to salt water intrusion—a very serious matter in southwest Louisiana where 600,000 acres are irrigated, and along the southern coast west of the Mississippi where there are no fresh water supplies.

The department has recently spent $250,000 on a model study of means to control the salinity problem in Vermilion Bay, which affects most of our irrigation streams in southwest Louisiana. More thought and study should be given to the proposal to utilize the coastal lakes and bays as interconnected parts of a vast reservoir system.

Ground-water levels have declined to an alarming extent in the rice irrigation and industrial areas of southwest Louisiana. About 250,000 of the 600,000 irrigated acres depend on wells for water. At some points, notably on the lower Vermilion River, the decline in water levels is accompanied by the entrance of salt water into the aquifer. The department, in cooperation with the U.S. Geological Survey, is studying this tremendous problem which is becoming more acute each year. In addition to causing losses ranging up to many millions of dollars annually, the salinity problem is retarding industrial development in an area extremely rich in mineral resources of petroleum, natural gas, salt, sulfur, and others. As a matter of record, 22 percent of the Nation's natural gas reserves, 16 percent of the petroleum, and about half of the sulfur reserves are found in coastal Louisiana.

The navigable waterways of Louisiana are among the State's most important assets, if not the most important. We have 7,500 miles

of navigable streams, of which 2,200 are maintained as regular arteries of commerce; most of the smaller waterways traverse the coastal marshes and provide the only means of developing the oil, gas, and sulfur deposits of an otherwise inaccessible area.

Most of the channels leading into the gulf were formerly adequate for the small fishing craft which were the principal users, but are now totally inadequate for the volume and type of craft which operate in this area.

The menhaden fishing industry, using large, deep-draft vessels, has become established at several points along the coast. The drilling and servicing of the offshore oil and gas fields, and the laying of marine pipelines, all requiring the use of large craft, are other recent developments which emphasize the almost complete inadequacy of existing waterways into the gulf.

Maintenance of adequate depths across the bars which form at the gulf end of our channels has always been a most expensive and difficult problem because of the tremendous load of suspended sediments brought down by the Mississippi and Atchafalaya Rivers. More research should be conducted toward solving this problem, including disposal of the sediments to form new lands at desired locations.

Louisiana's mild climate, its abundance of fish and wildlife, its beaches, lakes, and forests offer wonderful opportunities for recreational development. There are many recreational lakes which will have to be built and many existing ones which will have to be improved for public use over the next few years to accommodate our growing population, with the trend toward a shorter workweek affording more time for recreation.

Because of its extreme downstream location Louisiana is more in the position of being offended than of being the offender in the matter of stream pollution, and will always be vulnerable to harmful wastes originating in the upstream States of the Mississippi Basin.

Pollution from out-of-State sources is already a serious problem in some localities at this time, and is certain to increase with continued growth of the lower Mississippi Valley. Reasonable antipollution measures should be adopted and enforced through the medium of interstate compacts.

Decisions with regard to regulation of waste discharges in the entire Mississippi Basin should be examined in terms of maximum beneficial use of the streams. Studies of each section of the principal streams should be undertaken with this end in view—to determine, first, the nature and degree of pollution, if any; the most important uses of the stream in the particular section under examination; and the most economical means of relieving the situation.

The construction of the flood control plan in Louisiana has in many instances benefited the fish and wildlife interests by the creation of fishing and hunting areas and making them more accessible to the public. It has, however, denied a supply of fresh water to the swamplands along the Mississippi River below New Orleans and on the east side of the Atchafalaya River.

Provisions have been made for the introduction of some fresh water into the area east of the Atchafalaya River from the Atchafalaya and Mississippi Rivers. The situation along the Mississippi River below

New Orleans can be corrected by diversions from the Mississippi River.

It is inevitable that there will always be a conflict between flood control, navigation, and drainage interests and fish and wildlife interests of some areas. We believe that these interests should be evaluated and those projects favored which could contribute the most to the development of the State and Nation.

We believe that the solving of Louisiana's major water problems is a responsibility of the Federal Government. We believe this because they are created either by the waters from almost one-half of the United States flowing through Louisiana to the sea and by the necessity of providing and maintaining the navigation link between midcontinent America and markets of the world. Throughout the history of the United States, Louisiana, because of its willingness and its strategic position, has contributed as no other State has to the growth and development of the United States. With the help of the Federal Government we will continue to do so.

Earlier it was mentioned that the Louisiana Department of Public Works was the planning agency of the State government. We try to keep informed of our problems and plan ahead to take care of them as they develop. I am now going to ask our chief engineer, Mr. H. B. Myers, to itemize some of the planning we have been doing to take care of our future water problems, as we see them, both from the State and Federal standpoint.

Mr. Myers.

Senator ELLENDER. Mr. Myers.

STATEMENT OF H. B. MYERS, CHIEF ENGINEER, LOUISIANA STATE DEPARTMENT OF PUBLIC WORKS

Mr. MYERS. Senator Ellender, Senator Kerr, Senator Hart, the department of public works has prepared three maps for examination by the committee. These maps depict Louisiana's major water problems and show some of the solutions to these problems.

I want to ask Mr. Harrison, the chief of our reports section, to point out the projects that I will mention to you this morning.

There are three maps. One map is for flood control; one map is for navigation; and one map is for water supply.

(Maps, in color, are unable to be reproduced here.)

Mr. MYERS. I will first discuss the flood control needs. Although great progress has been made on the flood control plan, much still remains to be done if the flood control plan envisioned by Congress in 1927 is to be carried out and if we are to be given protection.

Mr. Wimberly has emphasized the importance of flood control. The key to the flood control plan in the lower Mississippi Valley is the Atchafalaya Basin floodway. This floodway must carry its designated portion of the project floodway. In order to do this the guideline levees must be enlarged throughout their entire length and a great deal more money is going to have to be expended for dredging in order to force the Atchafalaya to follow a single, efficient channel down through the floodway.

Below Baton Rouge the Mississippi River is in reality a gigantic harbor. In order to protect this harbor it is going to be necessary

to have adequate bank stabilization authorization, which we do not have at this time.

Above Baton Rouge, from Baton Rouge to Cairo, we are about to run out of authorization and additional authorization is needed from Baton Rouge to Cape Girardeau.

Below New Orleans a new problem has come in with the increased shipping and the increased use of motorships, which is for shore protection, for which there is no adequate authorization at this time.

The Red River backwater area, which is shaded in red, is only partially protected and must receive additional protection.

Other problems are the drainage intercepted by the Atchafalaya Floodway, the drainage of central Louisiana bayous, the drainage in the vicinity of Washington and Opelousas, and the drainage of the major streams in northeast Louisiana.

On the Red River, Mr. Wimberly mentioned the loss of valuable farmlands. Even though we have lost this tremendous amount of land and have tremendous damage from caving banks, we do not have an adequate bank stabilization program. There are several small levee projects which are needed along the Red River and several reservoirs, for instance, at Doreheat, Kisatchie, Mooringsport, and Millwood, which is not shown on this map.

On the Ouachita River we are interested in the construction of the Monroe floodwall and additional levees on Bayou Bartholomew.

In southwest Louisiana there is a great body of farmland which does not have adequate flood protection. It is drained generally by the Mermentau River system. This system should be enlarged to afford this great body of land with flood protection.

Also under study by the Corps of Engineers is the hurricane protection plan for all of south Louisiana, which is very vital to our economy.

Next I will discuss the navigation map. Navigation is almost as important to the State as the Mississippi River is to New Orleans because, as Mr. Wimberly pointed out, this navigation serves to bring the mineral, petroleum, and seafood wealth to the United States and to the markets of the world.

On deepwater navigation, we are interested in an increased depth to 40 feet in Calcasieu River and an increase to 40 feet in the Mississippi River from Baton Rouge to New Orleans.

The Louisiana Legislature directed the department of public works to make a study of enlarging the intercoastal canal from Lake Charles to Morgan City. Our study showed that it probably should be enlarged to Homer.

Such discussions seemed to indicate that there may be some possibility of carrying this enlargement as far east as the Mississippi River.

As to the inland waterways which connect to the deepwater navigation, we are still interested in navigation on the Red River and there is a resolution directing the Corps of Engineers to make a study for combining navigation on the Red River with the bank stabilization program on the Red River.

On the Ouachita River we are most anxious to see that the 9- by 100-foot project is gotten under construction.

There is also a possibility for navigation in the Mermentau, Nezpique, and Plaquemine Brule. The fresh-water bayou is one of our

most vital needs, as is the Bayou Lafourche-Jump, the Barataria Bay project, and the Vermilion River.

Now I would like to discuss the water-supply map.

I am sorry these maps could not be placed any closer to the committee.

Louisiana is fortunate in that its geography is such that water from the Mississippi, the Atchafalaya, and the Red River can be diverted to most of the other parts of the State.

There are two existing diversions which have proved very successful. One is the Donaldson Bayou pumping station. The other is the gravity diversion at Bayou Moreau into the marshes of the river in the vicinity of Port Sulphur.

The best project at present is the Hamburg pumping station, which will serve to divert water from the Atchafalaya River into Bayou Teche. Part of it will go down Bayou Teche, New Iberia, and out to Charenton Cut, and the other part will go down the Vermilion River. A part of this water can be relifted at Washington and pumped into the Mermentau Basin.

There is also a favorable location for diversion at Plaquemine, when and if the Plaquemine lock is discontinued. Part of the water from Bayou Lafourche should be diverted to Houma for fresh-water purposes.

In the northeastern part of the State there are a number of diversions which could be made from the Mississippi River into Lake Chicot, at Lake Providence, at Tallulah into Roundaway Bayou, at Fulton into the Tensas Bayou. Diversions could also be made from the Red River at Shreveport and at Alexandria.

There are also in the State many locations where water for industry, agriculture, and recreational use could be stored. The biggest and best site is the Toledo Bend Reservoir, which would hold as much water as Denison Dam holds. There are 5 million acre-feet of water. This would also have power in it as well as industry, agriculture, and recreational facilities.

The CHAIRMAN. That would not be on the Red River?

Mr. MYERS. No, sir. The Sabine River.

The CHAIRMAN. Yes.

Mr. MYERS. There are other reservoir sites in the State, such as the group of small reservoirs around Rapides Island here near Alexandria. The Mooringsport Reservoir could include as much as 200,000 acre-feet of municipal water.

The State has advertised a large reservoir near Farmerville at D'Arbonne and the existing reservoirs at Iatt and Cocodrie should be enlarged to take advantage of the full potential and the other sites at Dugdemona, Cypress Bayou, and there is, of course, the coastal reservoir system that Mr. Wimberly described to you.

There are also opportunities for development of beaches. The only one we use much now is Grand Isle. Beaches could also be developed in Cameron Parish, at Ocean View, Peveto, Holly Beach, and Vermilion, Chemiere au Tigre, Cypremont Point, at Morgan City and Lake Pontchartrain, and we are presently working on preserving the beach at Grand Isle.

Now, Mr. Wimberly also pointed out that there were pollution problems in the State and there are a number of things which should

be done to combat this State water pollution. One is the Calcasieu River low dam just above Lake Charles, which is now under study by the Corps of Engineers. The study is completed for the closure of Southwest Pass to improve the quality of water in Vermilion Bay. The Hamburg pumping station which I previously mentioned would also help to alleviate this salt water intrusion.

There is a need for additional fresh water in the Plaquemine-Lake Verret area.

As you know, on the Red River there are two kinds of pollution, both natural and manmade, and on the Ouachita River there is considerable pollution, but great progress is being made toward clearing that up.

That, briefly, enumerates the major water problems which we have in Louisiana.

Senator ELLENDER. Thank you, Mr. Myers.

Any questions?

Mr. WIMBERLY. Mr. Chairman, we have six witnesses here this morning who have requested to be heard early in order to make transportation connections for their commitments.

I would like to call the president of the Mississippi Valley Flood Control Association, Congressman Paul Jones.

Senator ELLENDER. All right, Congressman.

STATEMENT OF HON. PAUL C. JONES, MEMBER OF CONGRESS, 10TH DISTRICT OF MISSOURI, PRESIDENT OF THE MISSISSIPPI VALLEY FLOOD CONTROL ASSOCIATION

Mr. JONES. Thank you, Mr. Chairman.

Senator Ellender, Senator Kerr, Senator Hart, my name is Paul C. Jones. I am a Member of Congress from the 10th District of Missouri and president of the Mississippi Valley Flood Control Association. My home is at Kennett, Mo.

The Mississippi Valley Flood Control Association is somewhat unique among organizations in the water resources development field in that it is composed exclusively of local public agencies involved in the major Federal project for the development of the lower Mississippi Valley. These levee boards, port commissions, and similar special districts are for the most part elected, except in Louisiana, where they are appointed by the Governor. Most of these agencies have taxing powers and are composed of leading responsible citizens of their respective communities, located in the States of Arkansas, Mississippi, Kentucky, Illinois, Louisiana, Tennessee, and Missouri.

The Federal project for the development of the lower Mississippi River has been administered, for the most part, by the Mississippi River Commission, which was formed as an agency of the Corps of Engineers by an act of Congress in 1879. It therefore dates as one of the first, if not the first, Federal activity in the water resource field. Through the years, the program has been enlarged and expanded until it provides us with one of the most comprehensive development programs in the entire Nation.

The early development was almost entirely in the field of navigation because in much of the valley the river and its tributaries furnished the principal artery of commerce. Flood control, which had

its beginning in the New Orleans area in the 1700's, was considered an entirely local problem in which there was no Federal participation whatsoever until 1917, when Congress enacted the first of all flood control laws—the Flood Control Act of 1917.

From 1917 until the great flood of 1927, levees were built on a cost-sharing basis. Progress under that program was slow and results highly unsatisfactory, as demonstrated by the great flood of 1927. Under the 1927 act, local interests furnished rights-of-way and one-third the cost of construction.

The 1927 flood was one of the great catastrophes in the history of our Nation. The loss of lives and the impact on the Nation of having such a vast area left desolate and in financial despair resulted in the recognition by Congress of a Federal responsibility in flood protection. The culmination was in the passage of the Flood Control Act of 1928 which, as you know, is the grandfather act in this field of government as we know it today.

The compelling problem in 1928 was the construction of a levee system of sufficient height and strength to prevent the periodic destruction of the area by floods of the Mississippi River. As time has gone by, engineering progress has made possible the use of other tools—reservoirs, cutoffs, revetments, and floodways. There also has been the opportunity to extend protection to the great tributary basins and to the large backwater areas. Now, even in the tributary headwater areas, progress is being made—one of the first comprehensive soil conservation projects for flood control was authorized in the Yazoo Basin of Mississippi.

The recent demands of commerce and industry for a fuller utilization of navigation resources has brought about a concentration of interest in port and harbor development, an interest which is continuing and expanding. Because of the abundance of water in the area generally, problems of both supply and pollution have been rare up to the present time.

Except where fish and game are concerned, there have been relatively few conflicts of interest in the development program thus far, primarily because protection from floods is our principal problem, overriding nearly every other consideration. Our very lives and our economic well-being are directly dependent upon the security of the entire alluvial valley from floods of the Mississippi and its tributaries. Neither our agriculture nor our industry can survive without adequate flood protection.

We are extremely proud of the progress which has been made in the lower Mississippi Valley. We can face the future with a considerable degree of confidence and can view the past with pride in what has resulted from a fine joint effort of local interests and the Federal Government in the development of a vast area of the Nation.

Measured in terms of 1928 dollars, the local people spent nearly $300 million of their funds prior to the 1927 flood in what emerged as a fruitless effort to protect themselves from main-stem floods. Similar efforts on tributary streams had been made at tremendous cost. The total local effort was tremendous, the exact amount never to be exactly determined.

More than 30 years after the enactment of the 1928 act, there are still some levee boards in the valley paying on bonded indebtedness

accumulated prior to the 1927 flood. The main-line levee system has been built on rights-of-way provided by the local people and maintenance of the system is still our responsibility. Thus, there remains a heavy financial responsibility on the local people.

The local interests in the valley, because of their long experience which antedates that of any other section of the country, express the hope that your study and final recommendations will recognize the necessity for dominance on the part of Congress in the establishment of the basic policy under which our water resource development activities at the Federal level should be governed.

In our judgment, based on this vast experience, an effective and progressive program can be possible only in a climate in which the Congress is establishing the ground rules and exercising its power of the purse.

Rare indeed in the history of our country have we had an executive leader who was energetic and progressive in the field of water resource development. In our early history there were many historic battles between the Executive and the Congress over what were then called internal-development bills, and several presidents, reaching as far back as President Monroe, exercised the veto power because they did not believe that internal improvements were a proper field for exercise of Federal power. The two Roosevelts, one a Republican and one a Democrat, were perhaps the outstanding exceptions to the rule since both were vigorous proponents of resource development.

In more recent times, regardless of the party in power, the water resource development program has become the principal target for any fiscal economies sought by the Bureau of the Budget. The same Bureau has presumed to pass upon the technical aspects of projects studied by responsible agencies of government. It has presumed to impound appropriations and to establish other fiscal criteria which has meant defiance of the Congress and a strangulation to progress, typified by these developments.

We in the valley subscribe to the proposition that in a Federal program under our representative form of government, the basic policy under which the program is to be administered should be established by the Congress, whether that program be in the field of labor, agriculture, commerce, or public works. Our own program, which we believe has been highly successful, has for the most part been evolved under policies spelled out by the Congress on a bipartisan basis. We believe that Congress has faithfully discharged these responsibilities and express the hope to you that out of your studies there may result a reawakening of desire on the part of the Congress to continue to exercise these responsibilities in the interest and the welfare of all of our people.

I want to thank the committee for permitting our association to make this statement. Thank you for your courtesy.

Senator ELLENDER. Thank you, Congressman.

Any questions?

Mr. JONES. Thank you, sir.

Senator ELLENDER. Next.

Mr. WIMBERLY. Is Mr. Don O'Toole present?

(The prepared statement of Mr. O'Toole follows:)

STATEMENT BY DONALD O'TOOLE, PRESIDENT, MISSISSIPPI VALLEY ASSOCIATION

When the U.S. Senate passed Senate Resolution 48, we believe that a most progressive step was taken. The implementation of this resolution is not only important to this generation, but we firmly believe that it is of very great importance to succeeding generations. We believe sincerely that the solution of water problems of our country has a very deep and significant effect on our relationships with the rest of the free world. We, as Americans, do have obligations to the rest of the world, but those obligations cannot be carried out unless we keep America strong.

The proper use and management of the water resources of this country are absolutely essential if we expect to retain world leadership and if we expect to make maximum use for our own people of our greatest natural resource.

Other bodies have been created in the past to delve into the water-resources field and although they had official sanction their efforts usually resulted in administrative recommendations. They did not coordinate their efforts with other public or private interests nor did they realistically try to find not only what was physically needed but where. Neither did they direct their efforts or thinking to the requirements of the future with its, already-upon-us, expansions of population, industrialization, recreation, and transportation, to name a few.

The hue and cry in recent years has been for economy in Government and Government programs. Certainly we recognize and urge such economy and to this end I as president of the Mississippi Valley Association addressed our membership in 31 States on October 1, 1959, as follows:

"Our already enormous Federal debt is growing every day.

"Most of what causes the growth of the debt is beyond our control: Enermous military expenditures, billions of dollars of foreign aid, and maintenance of Social Security and other tremendously expensive Government programs completely integrated into our political way of life.

"When taxes collected are insufficient to meet these expenditures, debt is created and passed on to future generations. This has been going on steadily since 1950, and we may well feel sorry for the future generations who are going to have to pay off this debt. Our association fights to give these succeeding generations the tools with which to earn the money to pay off the debt.

"That is the big difference between other governmental expenditures and those sought by the Mississippi Valley Association: The other expenditures represent expenses and investments in things which are of absolutely no use in enabling future generations to manufacture, farm, and protect their properties; the expenditures we seek will enable them to—

"1. Produce manufactured products better with ample supplies of fresh water;

"2. Supply themselves and their factories with plenty of cheap hydroelectric power;

"3. Acquire their raw materials, and deliver their finished products to market, at cheapest possible transportation costs;

"4. Raise fine crops on our rich midwestern soils, with steady and ample supplies of water through irrigation and conservation;

"5. Protect their cities, factories, houses, and farms from the ravages of horrible floods;

"6. Dispose of their sewage and industrial wastes without damage to the factories, cities, and farms below them downstream.

"In all of his talks in the United States, Khrushchev laid heavy emphasis on the economic battle between the United States and Russia. Again and again he said 'We will beat you in this or that industrial activity.' The military defenses of the United States will be worthless if we are unable to compete in economic warfare with the Russians or any other nation. We must be able to produce goods at lower costs than theirs, to deliver our products to markets at lower selling prices.

"We can achieve these goals only if we, and our children and grandchildren, possess the best possible facilities for production and delivery. We know that the Russians are equipping their people with the best factories, powerplants, canals, railroads, and other industral devices.

"The Mississippi Valley Association continues to fight for appropriations for public works needed for our production and protection of our productive facilities.

"We struggle endlessly against the apathy and frequent shortsightedness of Government. We are truly concerned about the future—and we are doing something about it."

We are not naive enough to believe that every suggested water-resource project, that is a gleam in someone's eye, or conceived selfishly for one's gain at another's expense, should be undertaken as a Federal project without further delay, even though that may be the genesis of some project being built on foreign soil with American dollars. Neither do we believe that the Bureau of the Budget Circular A–47 and its amendments should be an inflexible yardstick to measure, in our expanding economy, benefits that will accrue from worthwhile and properly conceived water-resource projects needed in this country that will permit expansion of our economy.

For more than 40 years, the Mississippi Valley Association has been engaged in fostering water-resource development of all kinds in the belief and knowledge that such development is the primary tool in economic development and national preparedness. Our sponsorship has not been restricted to any one phase of water-resource development. We have contended that each use complements the others.

Our basic thesis is that to be of beneficial use our water must be controlled.

So far as the drainage area of the Mississippi Basin and the gulf coast section is concerned, we feel that controlled water, properly managed will provide: a full measure of flood protection, a transportation network fully utilizing all forms of transport, sufficient water for domestic, industrial, and irrigation requirements, facilities for growing recreation demands, accelerated soil conservation and reforestation, the conservation of underground water, and the ability to sustain an expanding economy.

There are available many reports that provide estimates of what may be expected in the next 15 to 20 years in the fields of population expansion and industrial expansion, as well as what agricultural requirements, and water requirements will be needed to accommodate these expansions. It is singular, I believe, that in just about every case, the estimates are obsolete by the time the reports are printed with the estimates needing to be revised upward. Despite this circumstance, past history in the field of water-resource development remains the only reliable yardstick for estimating the future requirements from both the physically needed and the cost-to-install standpoints. These estimates, it appears to us, can best be made if they are directly referred to population figures.

With a present (1959) population of 177 million and an estimated total (to 1959) capital investment in water-resource development both Federal and non-Federal, and for all purposes of water use, of $179 billion, we arrive at a per capita cost of $1,028. Water and sewerage utilities account for a third of the total investment. Our need in 1980, if our population rate of increase remains constant at 3 million plus per year, and reaches 246 million in 1980, would be $250 billion. This is, of course, a straight-line projection and as sizable as it appears is inadequate for the simple reason that the demand for water for all purposes has increased and will continue to increase far more rapidly than was visualized a short 5 years ago.

Industrial experts tell us that in the next 20 years industry will be using three times as much water as it is using now. Virtually the same forecasts are being made by municipal water and sewerage interests. To feed our growing population will require a like increase for irrigation purposes.

Whereas the above-mentioned 71 billion straight-line projection of needed expenditures for water-resource development of all kinds between the present and 1980 is sizable, the Department of Commerce in June 1959 estimated that $171 billion more must be invested between now and 1975, and they state:

"This projection is based on conservative estimates of population growth, industrial expansion, and other factors which determine water demand."

Lt. Gen. Emerson C. Itschner, Chief of U.S. Army Engineers when he appeared before the Senate Public Works Committee on August 4, 1959, stated:

"* * * We simply must adapt our water-resource planning and development activities to the dynamic, long-range requirements of an expanding population and economy. This will require full recognition by all levels of government and all elements of our economy of the compelling importance of water resource development, and the full cooperation of all concerned in overcoming conflicts of interest and solving the problems of financial responsibility for this work. * * *"

Municipal and other public interests are far better qualified than are we to present the case for domestic and municipal requirements to 1980, accordingly,

we make our case in the fields of flood control, navigation, irrigation, hydroelectric power, pollution control, and recreation.

In the Mississippi Basin the flood-control program is well advanced, particularly in the alluvial plain of the Mississippi River. However, until the optimum flood prevention facilities are installed the Mississippi River Basin will not be able to realize its full economic potential. For this reason, we respectfully urge that the flood control, Mississippi River and tributaries, project be completed to required grade and section by 1970. Also we urge that the facilities for flood prevention on the rivers tributary to the Mississippi be programed so as to be essentially complete by 1975. In regard to these tributaries, we urge further, that particular efforts be directed to early flood-control works on the Arkansas and Red Rivers, both of which have suffered recurring and extensive flood damages through the years, with attendant losses of valuable lands through caving banks. We note that the multipurpose program currently underway in the Arkansas Valley is scheduled for completion in 1971 and we urge that that schedule be adhered to.

The Missouri River project is only partially completed, and one of the most urgent needs today in that project that was undertaken back in 1945 is the completion of the 9-foot channel to Sioux City. The navigation project between St. Louis and Kansas City is farther behind schedule than is the section between Kansas City and Omaha. Very satisfactory progress is being made on the project between Omaha and Sioux City, but its value to the public will be greatly impaired until the St. Louis-Kansas City stretch is completed. Restrictive language in the recent appropriation bill pertaining to this stretch of the Missouri River has been most harmful and should not be repeated in subsequent appropriation bills.

The flood control project on the Kansas, the Marais des Cygnes-Osage must be rushed to completion to save a repetition of the catastrophies to agriculture and industry that have been witnessed in the past. Too long have we delayed the start of the flood control project on the Floyd River, and it is our recommendation that this project be made a crash program until completed.

We will not attempt in this discourse to discuss all of our problems, our achievements, or our setbacks. We are simply trying to emphasize the urgency of water resource development and proper management of those water resources without the impediments of lowered bridge heights that will injure the free movement of heavy bulk cargoes by barge.

In short, we think in the last decade we have made remarkable progress with the help and aid of the Congress of the United States, but we must guard against complacency, apathy, and restrictions that imperil the momentum we are building.

In regard to the Red River flood control program we note that the Flood Control Act of 1946, as modified, provided for a comprehensive plan of improvement. The lack of implementation of the comprehensive plan has been evident by the great number of emergency construction and repair works. Since 1946, a total of 94 such works have been necessary. These have been levee setbacks, crevasse closures, and emergent new or replacement levee construction. It is thus apparent that the flood control facilities on the Red are sorely needed now. We therefore request that the comprehensive plan for the Red River be programed for completion at the earliest practicable date but not later than 1970.

Speaking generally on the flood prevention problem, we note with interest that the flood control facilities heretofore constructed in the country have prevented about $9 billion in flood damages, whereas the cost of construction of these facilities, since 1936, has been about one-third of the benefits. Consistent with these figures are those for the Ohio River Valley whose flood control program is approximately 40 percent complete. Flood control costs in the Ohio Valley have been about $300 million and they have prevented damages of $640 million. We should remember that in early 1959 floods in the Ohio Valley caused an estimated $75 million in damage and that flood control facilities in operation prevented an additional damage of $121 million.

The "Main Streets" for industry today are America's improved waterways. By providing process water in great quantities and low-cost barge transportation the areas of distribution or competition are constanly being expanded. Our navigable waterways, since World War II, have been the cornerstone upon which our new and expanded industrial complexes have been built. They will continue to be the basis of any future industrialization, for industry is the thirstiest segment of our economy and becomes thirstier each year. This coupled with

the need for transporting raw materials and many finished or semifinished products at the lowest possible cost, for competitive reasons dictates this premise.

The Ohio River story with its $15 billion industrialization since World War II is common knowledge today. Additionally, the New Orleans to Baton Rouge complex has been widely publicized, but a few effects on the economy of an area by virtue of navigable water are germane.

The 140 miles of the Mississippi River between Baton Rouge and New Orleans courses through or along 13 parishes. The face of these parishes has been changed from basically agricultural to predominantly industrial with these results: Population increased 26 percent since 1950 compared to 16.1 percent for the Nation (one parish increased 167 percent); per capita income in these parishes increased 61 percent between 1951 and 1959, compared to a national increase of 37 percent in the same period; retail sales increased 42 percent, about 10 percent above the national average. A total of almost 32,000 additional jobs were created in this area.

Although a great amount of work has been done in developing our Mississippi Basin and gulf coast waterways for barge transportation, much more remains to be accomplished. Some of this remainder is authorized and under construction such as on the Arkansas and the modernization program on the Ohio. If our total transportation industry is to function for the best interests of all of our citizens we must have a complete transportation network served by rail, truck, barge, air, and pipelines. Each has its inherent advantages and each should be geared to accommodate its maximum potential and as service industries they should also serve the best interests of the areas they traverse.

Barge transportation generates more new business for other forms of transportation than is ever taken from other forms of transportation.

A striking example of the failure on the part of a transportation mode to serve the best interests of an area may be seen in the Arkansas Valley. In comparison with other areas that have all forms of transport we find that the Arkansas Valley areas have been beset with a severe trade barrier by virtue of high transportation rates, notwithstanding the fact that this valley is perhaps the richest in resources of any in the country. The significance is that this valley has every transportation mode save barge. Fortunately, albeit late, this condition is in the process of being corrected and we are certain that before the scheduled 1972 completion of the navigation program on the Arkansas, overland transportation rates, to and from these areas, will be reduced.

The tremendous benefits that have been and are being realized dictate that every effort be made to accelerate the development of our water resources program to accommodate navigation either by new construction or modernization.

Barge transportation is comparable to none other when it comes to the movement of heavy bulk commodities, and the navigable channels of the United States should remain ever free for all of the public to use. The public has paid for these navigation projects, and the imposition of tolls or user charges would simply be a double payment by the public for the use of that which is already theirs.

The platform of the Mississippi Valley Association is appended to this statement and it clearly states the views of our membership on the worthy navigation projects needed in the areas we serve. We respectfully request its full consideration. It is our thinking that the construction recommended therein, both authorized and yet to be authorized, will adequately accommodate the needs of our areas to 1980.

The problem of irrigation has, in the past, been considered as pertaining only to the 17 Western States. This concept is no longer true. Recent years have shown us that irrigation has become a requisite in the so-called water-rich States in the lower Mississippi Valley and the gulf coast region. With Louisiana's abundance of water and normally high annual rainfall, it has been necessary to irrigate millions of acres in Louisiana in recent years. Louisiana now has more irrigated area than any one of the long-recognized western irrigation States of Arizona, Nevada, New Mexico, Oregon, Washington, Utah, and Wyoming. Large increases in irrigation have been necessary in Florida, Connecticut, New Jersey, New York, and Wisconsin which point up the fact that irrigation is a national problem.

Why is irrigation a national problem? The answer is that only irrigation can alleviate the poor distribution of natural precipitation, permit the broad diversification of crops necessary to meet increasing national and international

demands, and contribute to the stabilization of the economy of heavily populated areas. An orderly, national plan of irrigation is a must program despite references to crop surpluses. The history of the world shows that it was not the nations with surpluses that died, rather it was the have-nots.

Irrigation interests should be adequately supported, and attention should be called to the fallacy that the farm-surplus problem in America contradicts the argument for irrigation. Most irrigated crops are those that are not surplus crops, and irrigation has made possible the change of land use from wheatland to land for other crops that are not now in surplus and will likely be in short supply in the years to come.

It is recognized that in a comprehensive plan for the development of our valleys to provide for flood control, navigation, and irrigation, dams of the so-called multiple-purpose type can be constructed in many localities without serious impairment of the primary purposes for which the dams are constructed. It is urged that wherever such conditions exist and multiple-purpose dams can be economically justified, Congress proceed with the authorization and appropriations for the construction of such multiple-purpose dams.

Due to the nature of the streamflow in the Mississippi Valley, power and energy generated from any such multiple-purpose dam in the area will vary materially with rainfall. Therefore, the production of power must be purely incidental to the primary purposes for which the dams are designed. Our position on the production and the sale of hydroelectric power is clearly set out in our 1959 platform previously mentioned.

America's water pollution control program must recognize the multipurpose nature of our water resources. Overuse for any single purpose may have a detrimental effect on one or more of the other uses. Therefore, there must be a balanced approach to the control of pollution, recognizing that, while the carrying of treated waste is an essential use of our streams, many other interests share in the use of our vital water resources.

It is hoped that H.R. 3610, 86th Congress, will be enacted into law early in the second session of this Congress. This legislation provides an additional $50 million per year, making a total of $100 million per year available to communities to assist them in the construction of sewage-treatment-plant facilities. This legislation will contribute greatly to minimizing the pollution problem. We feel without legislation of this type that many communities would be unable to construct these facilities.

Pollution control is aided by increased low-flow regulation in our streams. This low flow can be augmented by Congress providing for it on a nonreimbursable benefit basis.

We recognize the problems of salt-water intrusion of streams in the coastal regions and the alkali problems of the inland streams, and we urge Congress to provide the necessary funds to continue studies toward a satisfactory solution.

We urge Congress to enact laws which will provide optional accelerated amortization of the costs of industrial waste facilities.

We strongly recommend that Congress appropriate sufficient funds to the Public Health Service to accelerate its present water control program, and encouragement be given to State pollution control agencies, thereby enhancing the future water resources of our Nation.

We urge State legislation to permit private companies to construct and operate sewage systems for the protection of the people served as well as for the protection of the companies involved and thereby encourage private enterprises to participate fully in the area of water disposal and stream pollution control.

Water hyacinth and aquatic plant infestation has spread tremendously into the tributary waters of our principal streams.

Clogging of waterways has become extensive, often blanketing a long stretch of water course from bank to bank. Present authority for the destruction and removal of these harmful plants by the Corps of Engineers is limited to certain navigable waters so far as they constitute an obstruction to navigation.

We urge that Federal authority for control and progressive eradication measures be extended in the interest of navigation, flood control, pollution abatement, drainage, agriculture, fish and wildlife conservation, and public health.

Our increasing population coupled with an improving standard of living with more leisure time are occasioning a growing requirement for additional recreation facilities. The water resources development program that is underway

and that part of it that may be envisaged at this time can serve a great part of the demand. It is our belief that recreational benefits accruing from water resources development should be properly evaluated; also, that these benefits should be included in determining the economic justification of any future project. State and local governments have a definite responsibility in this area and their cooperation with the Federal agencies to provide adequate facilities should be of the highest order.

This fiscal year and the last have each seen Federal appropriations for water resource development programs in the approximate amounts of $1.1 billion. Because we do not know what cost of construction will be nor do we know what our ability as a nation will be to accelerate the program of water resource development, we are not recommending any specific amount for each of the years to come to be appropriated by the Federal Government. We do strongly believe, however, that there should be a change in the bookkeeping system of our Government. Water resource development projects are capital investments and should be so treated on Government records.

Capital investment in sound water resource development projects is perhaps the best investment we as a nation make. There is no comparison between an investment in a water resource development project and ordinary expenditures such as the maintenance of a soldier, sailor, or marine. Industry differentiates between capital investments and ordinary expenditures, and we fail to see why the same general accounting practice by the Federal Government would not tend to clarify our thinking and would give the people a clearer picture of how their money is being invested and expended.

We of the Mississippi Valley Association feel that great progress has been made, particularly in the last decade, on water resource development in the United States.

We have not gone fast enough, but that is no fault of the existing agencies of the Government—the Corps of Army Engineers, the Bureau of Reclamation, the Soil Conservation Service. All have done outstanding work and should retain their existing responsibilities for water resource development.

Delays have been almost entirely the results of lack of fixed governmental policy, of the painful processes which must be followed in order to secure the full round of approvals and authorities from various governmental units, and of arbitrary actions and decisions by some governmental units entirely independently of others.

Perhaps valley authorities similar to the Tennessee Valley Authority could cure all these delays, for in creating such authorities, Congress simply turns over almost all of its own responsibilities to the valley authorities. We think valley authorities are wholly unnecessary and undemocratic—they represent the easy way out instead of patiently working to make ordinary democratic processes function effectively. We believe that extension of governmental controls and operations further into the development of power is always dangerous to democracy, and should be avoided.

The power and other resources of our river valleys can best be developed by private enterprise and private capital, especially when the affected agencies of government—particularly of the legislative and executive branches of the Government—join willingly, sincerely, and enthusiastically with units of private enterprise in making the partnership work.

PLATFORM
MISSISSIPPI VALLEY ASSOCIATION

Adopted
40TH ANNUAL MEETING
ST. LOUIS, MISSOURI
February 1-2-3, 1959

FOREWORD

The management of our natural resources, particularly soil and water, is the foundation upon which the future of America will be built. The Mississippi Valley, comprising a major part of 23 states, is richly endowed with natural resources which have contributed significantly to America's civilization.

We rededicate the Mississippi Valley Association to continued vigilance and aggressive action to foster the wise management of these natural resources.

Only if all aspects of soil and water management are considered as essential and inseparable elements of the whole problem of water and soil management can this nation meet its obligation to an expanding population to provide:

1. A full measure of flood protection
2. A transportation network fully utilizing all forms of transport
3. Sufficient water for domestic, industrial and irrigation requirements
4. Facilities for growing recreation demands
5. Accelerated soil conservation and reforestation
6. The conservation of underground water
7. The ability to sustain a stable, expanding economy

WATER AND SOIL RESOURCE MANAGEMENT

BANK STABILIZATION

Thousands of acres of America's most productive farm land along the banks of our nation's rivers are being destroyed annually. We urge Congress to correct this staggering national loss. A systematic program of bank stabilization will also protect flood control structures, aid navigation and avert the relocation of valuable public and private facilities such as levees, highways, railways, bridges, dock and harbor and industrial installations.

CONGRESSIONAL RESPONSIBILITY

The responsibility for the authorization of projects and the control of funds appropriated for their construction rests with Congress.

The Bureau of the Budget is infringing upon and thwarting the authority of Congress by selecting projects for construction and allocating funds appropriated by Congress for such specific projects.

We are opposed to these practices of the Bureau of the Budget and recommend that Congress now reassert its constitutional authority and responsibility by directing that the funds appropriated by Congress be expended for the specific purposes for which the appropriations were made and that Congress prevent attempts by the Bureau of the Budget to exercise control over mandates of Congress.

CONTINUING CONTRACTS

We believe that the good faith of the United States is involved in making adequate funds available to complete continuing contracts at a rate which will permit the contractor to prosecute his work with the greatest possible economy.

FEDERAL REGIONAL VALLEY AUTHORITIES AND ADMINISTRATIONS

We oppose the creation of additional federal regional valley authorities or administrations for the control and operation of our nation's river basins.

Such entities become superstates, transcend state and local government and are not subject to sufficient control by Congress or regulating and auditing branches of government.

It is our sincere conviction that all legitimate objectives of land and water conservation can be achieved under the coordinated direction of existing agencies without the state socialism inherent in any regional authority, no matter how disguised.

We urge Congress to enact legislation providing for river basin control and operation by existing agencies in cooperation with the states involved.

FEDERAL STEAM PLANTS

We believe that controlling floods, providing and improving navigation, reclaiming arid lands, protecting soil against erosion and generating hydroelectric power incidental to these functions are proper activities of the federal government.

We oppose the construction of steam generating plans for the production of power for resale by authorities, administrations or agencies of the federal government.

The construction of steam plants for the generation of power for commercial resale puts the federal government into the power business in direct competition with its citizens and is not a proper function of government.

We oppose the use of continuing funds by the Department of Interior for the purpose of enabling rural electric cooperatives to build steam plants and high voltage transmission lines for direct sale or lease to the Department of Interior. Such loans avoid the clearly expressed intent of Congress to control the operations of these two agencies through annual appropriation bills.

FISH AND WILDLIFE

We believe that the effect of constructing water resource projects upon the fish and wildlife of the area should be considered by the appropriate governmental agencies and that all practical steps should be taken to avert serious damages to these resources. However, we oppose any interpretation of recently enacted legislation which would permit the Federal Fish and Wildlife Service or any other agency to delay

or require excessive modification of plans for projects authorized by Congress.

FLOOD CONTROL

We consider the catastrophic loss of lives and property due to floods to be an unnecessary drain upon the resources of this nation. We recommend that flood control projects be vigorously prosecuted to completion, with particular efforts to expedite projects which will also contribute to the development of navigation, the security of municipal and industrial water supplies, the reduction of stream pollution, the development of irrigation and the incidental generation of hydroelectric power.

FORESTRY

We emphasize the importance of scientific forestry practices to flood and erosion control and to the over-all national economy.

We recommend a more foresighted policy of forestation, reforestation and adequate protection from forest and range fires as basic to the production of timber and forage and the control of erosion and water run-off. We urge that the states extend fire protection to all lands in need of such protection and intensify their programs where present efforts are not adequate. We endorse the principle of federal-state cooperation in fire control.

We urge as necessary to an effective forestry program: insect and disease control; adequate congressional appropriations for timber harvesting; access roads and reforestation; state and federal funds for research in forestry by our state agricultural colleges; education for proper care of privately owned forests and ranges; encouragement of private ownership of forest and rangeland rather than the increase of federal ownership; adequate appropriations to continue the program of the U. S. Forest Service.

HYDROELECTRIC POWER

It is recognized that in a comprehensive plan for the development of our valleys to provide for flood control navigation and irrigation, dams of the so-called multiple purpose type can be constructed in many localities without serious impairment of the primary purposes for which the dams are constructed. It is urged that wherever such conditions exist and multiple purpose dams can be economically justified, Congress proceed with the authorization and appropriations for the construction of such multiple purpose dams.

Due to the nature of the stream flow in the Mississippi Valley, power and energy generated from any such multiple purpose dam in the area will vary materially with rainfall. Therefore, the production of power must be purely incidental to the primary purposes for which the dams are designed. For this reason, and in order to protect the primary purposes of the dams, it is urged:

1. That the incidental power and energy produced at such multiple purpose dams be sold at the bus bar or from high voltage lines constructed by government agencies to existing agencies, both public and private, engaged in production and distribution of electric power and energy in the contiguous area, for resale by them to their customers without discrimination or preference.

   We recommend and will support legislative amendments to the federal statutes (Public Lands Law, U. S. Code Title 43, paragraph 485-H), so as to make possible a fair and equitable distribution of publicly created hydroelectric power, so that the benefits shall be available to all communities, citizens and taxpayers without discrimination.
2. That wholesale rates for such sales be set by the Federal Power Commission.
3. That sale and accounting for such incidental power and energy be made and carried by the existing agencies of the federal government designing, building and operating such multiple purpose dams, i.e., the Corps of Engineers or the Bureau of Reclamation.
4. That purchasers of wholesale power pay to the government, as a minimum, the actual cost thereof, including, in addition to ordinary operating expenses, interest at average rate on governmental borrowings and amortization of the cost of the project allocated to the power production over a period not to exceed 50 years.
5. That any and all savings or profits accruing to the purchaser at wholesale rates, under what similar quantities of electrical power and energy would have cost the purchaser to produce by the best and cheapest alternative method.

be passed on to its retail customers in the area, in the amounts and in the manner prescribed by proper regulatory authorities.

6. That Congress favor the continued development of hydroelectric power facilities by private enterprise wherever private enterprise is ready and willing to undertake such development without impairment of other beneficial uses of water. Such development can provide annual tax revenues of importance to federal, state and local governments and can relieve the national treasury of part of the cost of necesary national development of water power resources.

NEW STARTS

It is a vital precept of sound national policy that there be an orderly programming of planning and construction of water resource projects authorized by Congress. Such a program requires that new projects be started each year as other projects approach completion.

To implement this program in keeping with good business management and to protect our own economy, nothing short of a shooting war should retard or delay the development and conservation of our valuable water resources.

We therefore urge Congress to insist upon a reasonable number of new starts each year, both in planning and construction. In this connection, we believe that planning is not sufficiently ahead of construction to provide adequate flexibility in carrying out a broad program and urge that the number of planning starts be increased rather than diminished.

The planning and construction of water resource projects which are component units of comprehensive programs already under construction should not be delayed by defining such projects as "new starts." Such an erroneous interpretation destroys the integrated function of other elements in the comprehensive program, diminishes their benefits, is wasteful of funds and is not in the public interest. Neither should the term be applied to restudies or re-evaluations of programs on which there has been a previous favorable report to Congress.

PUBLIC INVESTMENT IN RESOURCE DEVELOPMENT

Funds to plan, construct and maintain flood control, navigation and land and water conservation programs are now considered by Congress to be current fiscal expenditures whereas, in reality, they should be considered national capital investments in the security and welfare of the nation.

We urge Congress to consider these great national programs on a capital investment basis and to set a schedule for their completion in a minimum number of years.

RECLAMATION

Next to the consumptive use of water for municipal and domestic purposes, we consider the development of arid lands by irrigation to be the highest beneficial use of water in the 17 western states.

RECREATIONAL BENEFITS

There is need for a monetary evaluation of the recreational benefits created by the construction and operation of reservoir projects under programs of flood control. navigation and reclamation. The evaluation of such benefits should be considered an integral part of the total benefits accruing to such projects. Since such benefits accrue to the people of the nation and are available to all, they should be non-reimbursable. The inadequacy of present facilities to meet the demands of the vacationing public is apparent and must be supplemented by accelerated programs for recreational facilities. Such facilities on all reservoirs should be fully developed through the cooperation of federal, state and local agencies.

RESOURCE PROGRAMS OF INTERSTATE CHARACTER

We deplore the apparent ability of local interests to defeat or delay water resources programs already approved and authorized which are interstate in character and national in their benefits.

SMALL WATERSHEDS

We urge the several states to pass enabling legislation to create public agencies with power to contract with local, state and federal agencies to develop small watershed conservation programs.

SOIL CONSERVATION

Recognizing the need for permanent conservation of America's agricultural land and water resources, we urge the consolidation of federal activity in this field, including research, education, on-site technical assistance and financial aid, within the soil conservation districts.

We commend the more than 2700 soil conservation districts for their great accomplishments.

We oppose any attempt to weaken these locally created and operated districts by federal legislation or executive order.

We urge close coordination of upstream water retardation activities with the downstream programs of the Corps of Engineers and the Bureau of Reclamation.

SURVEYS AND PLANS

The proper development of the soil and water resources of this country requires advance study, engineering design and orderly construction. The orderly progress of projects from one phase to the next is defeated by the denial of funds for surveys and plans. The President's budget now under consideration by Congress is entirely inadequate to maintain the proper continuation of this work so vital to our national economy and our national defense program. We urge Congress to include a material increase in appropriations for surveys and plans.

TENNESSEE VALLEY AUTHORITY

We reaffirm our position that Congressional control and territorial limitations are necessary for the Tennessee Valley Authority, in order to prevent undue encroachment on private enterprise.

We oppose any TVA legislation which does not provide for bona fide congressional control, effective territorial limitation to its present power service area and recognition of the need to service TVA's debt to the Federal Government without subordinating it to subsequent financing.

USE OF EXISTING AGENCIES

We endorse the excellent work of the existing federal agencies responsible for the development of the land and water resources of the Mississippi basin.

We oppose the creation of any public works agency which would consolidate or interfere with those agencies long expert in their respective fields.

We insist that no reorganization plan shall adversely affect any civil function of the Corps of Engineers. Such a plan would eliminate a century's engineering experience, scatter trained personnel, destroy the esprit de corps which has made the Corps' work outstanding throughout the world and withdraw from the Army a valuable peacetime training activity which has proved its worth in time of war.

WATER RESOURCES

We urge Congress and the state legislatures to appropriate adequate funds to pursue continuing studies of all matters affecting water resources, including drainage, precipitation, evaporation, infiltration, surface run-off, underground movements, quantity and quality of surface and underground waters and allied matters. Such studies should be made by the Corps of Engineers, the U. S. Geological Survey, the Departments of Agriculture and Interior, and other appropriate federal and state agencies.

We recommend a concerted study of underground water supplies to the end that our diminishing underground water be replenished and its beneficial use perpetuated.

We urge Congress to establish a formula which will assign an economic value to all benefits, direct and indirect, resulting from water resource projects, including domestic and industrial water supply, irrigation, pollution abatement, enhanced land values, recreational advantages and economic benefits associated therewith, as well as those benefits presently recognized, and that such values be used in computing the cost-benefit ratio of all such projects.

We commend the 85th Congress for the passage of the Water Supply Act of 1958. We urge that flood control and multiple purpose reservoirs be of such size and be operated in such manner as to provide protection from floods and to provide maximum conservation storage to implement the provisions of this Act.

DOMESTIC AND FOREIGN TRANSPORTATION AND TRADE

BRIDGE CLEARANCES OVER NAVIGABLE STREAMS

We oppose the construction of bridges over navigable streams which would hinder present or future use of those streams for water transportation and related activities.

CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY

We urge Congress to enact legislation which would give the Interstate Commerce Commission authority, after hearing, to modify or revoke certificates granted to common carriers by water for willful failure to operate in conformity with the provisions thereof.

FEES FOR SERVICES AND DOCUMENTS

We believe that the present law (Title V Public Law 137, 82nd Congress), directing federal agencies to assess specific charges for work or services performed, should be repealed because it is arbitrary, unworkable and indefinite.

INLAND AND INTRACOASTAL WATERWAYS

The full development of our inland and intracoastal waterways is essential to the maintenance and growth of the nation's commerce and defense. We urge renewed national interest in modern, standardized waterways as an essential ingredient to an integrated domestic transportation network. This program should include:

1. The improvement of our waterways to carry such tonnages as might be required by a national war effort.
2. The improvement of the interconnections between the inland systems and the Great Lakes and Gulf of Mexico.
3. The improvement of the physical condition of the locks and dams on the nation's inland systems.

We urge Congress to appropriate sufficient funds to complete and maintain the inland waterways so that authorized channel depths are continuously available during the navigation season.

INTEGRATION AND COORDINATION OF TRANSPORTATION FORMS

We believe that our excellent system of distribution has reached its present state of efficiency under a system wherein competing forms of transportation are substantially restrained from entering other fields of transportation. We oppose any relaxation of these existing restraints.

We believe that even greater efficiency can be achieved by the coordination of different forms of transportation in such combinations of rates and services as best fit the needs of the shipper. We believe that such coordination of different and independent modes of transportation will be more favorable to the continued growth in the efficiency of the different modes of transportation than a system of integrated transportation companies, engaged in all forms of transportation.

ISSUANCE OF CERTIFICATES BY I.C.C.

We reaffirm our opposition to legislation which would amend the respective rail, motor carrier and water carrier provisions of the Interstate Commerce Act so as to require that in the issuance of certificates of public convenience and necessity, consideration must be given to the adverse effect upon all other types of common carriers.

JOINT RATES

For the purpose of providing adequate and efficient coordinated transportation service by all forms of transportation within the Mississippi Valley, by which each form of transportation can best serve according to its inherent abilities, we recommend and will promote the immediate formation of conferences, as authorized by the Interstate Commerce Act, between carriers by rail and water, between carriers by highway and water, and

between carriers by rail and highway, for the joint consideration, initiation, or establishment of rates, classifications, divisions, allowances, charges or rules and regulations pertaining thereto, relating to transportation under joint rates or over through routes.

MERCHANT MARINE

We pledge our active support to the promotion and maintenance of a strong, well balanced, privately owned and operated U. S. merchant marine to provide the shipping services essential to our industry, agriculture and commerce in time of peace, capable of implementing our international policies and ready to serve our national security in time of war.

We strongly urge that United States industry voluntarily patronize American flag ships in order to assist in developing and strengthening the American merchant fleet.

We commend the Chairman of the Joint Chiefs of Staff for his forthright declaration of the continuing need for an American merchant marine for the defense of our nation; and the maritime industry for its efforts to demonstrate that in addition to its defense role, the industry makes a substantial contribution to the economic welfare of our country.

We reaffirm our support of the 50/50 Law requiring that at least 50 per cent of the cargoes generated by the United States government should be transported in U. S. flag ships to the extent they are available at reasonable rates.

We reaffirm our support of the basic principles and procedures of the 1936 Merchant Marine Act and its program of federal support, based upon the principles of parity and of essential trade routes operated by American companies which are domiciled, owned and controlled in the domestic areas which they serve.

We condemn certain practices of foreign nations, which discriminate directly or indirectly against American flag shipping and we urge increased effort by the Department of State to seek their elimination.

We commend the efforts being made by industry and the administration, with congressional support, to begin the largest peacetime vessel replacement program in our history and we urge adequate appropriations by the federal government so as to insure that, when combined with private investment, there will be sufficient funds to maintain an orderly and economic replacement schedule.

We recommend an expanded government research program on ship design, ship propulsion and port facilities so that the latest and best information will be available to various segments of the American merchant marine.

We recommend that, in the event of mobilization, the merchant marine be placed under the jurisdiction of the Maritime Administration so that the experience and knowledge of the management of privately owned steamship companies may be effectively utilized.

We support the United States Government's policy of encouraging effective steamship conferences for the purpose of insuring rate stability and fair and equal treatment of shippers and receivers in international commerce.

We also endorse the principle that such steamship conferences, to be effective and to meet the competition of non-conference steamship lines unwilling to accept the responsibilities of conference membership, must be permitted to continue entering into reasonable contractual arrangements with shippers and receivers tying together the parties to the contract.

RECIPROCAL TRADE

We believe that the reciprocal trade agreements program begun in 1954 has served the United States extremely well; has contributed substantially to expanded and healthy two-way foreign trade and has put the United States in the lead for liberalization of trade which is a major contribution to world peace. We commend the 85th Congress for extending the Trade Agreements Act and recommend that no crippling amendments to this legislation be countenanced by the 86th Congress.

SNAGGING AND CHANNEL CLEARING

We recommend that sufficient funds be appropriated to carry out the authorized program of snagging and channel clearing.

TOLLS ON INLAND WATERWAYS

In response to a new threat of waterway tolls or user charges, we reiterate our determined opposition. Such an imposition would violate the most solemn covenants of the federal government, repudiating the fundamental principle that the navigable waters

are free, public highways, improved by the nation for the benefit of all the people and available to all without toll, tax, or impost. This principle has profoundly affected the development of our national life. Indeed, it is the foundation of the great resurgence of industry now in progress in our principal river valleys. It can be repudiated only at the price of incalculable economic dislocation and waste.

The railroads themselves would be among the principal sufferers from waterway tolls for they benefit enormously from the high value freight generated by plants relying upon water transportation for raw materials and fuel. Their proper economic role is complementary and not competitive with water transportation.

User charges or tolls would destroy the commerce upon which they are levied. They would deprive the nation of its modern barge fleet and associated facilities, a major national defense asset, render the federal investment in waterway improvements useless, hamper and discourage the development of water resources for all beneficial purposes and work grave hardship on the lives of millions.

TRANSPORTATION ACT OF 1940

We urge the Interstate Commerce Commission, in its enforcement of Section 3 (4) of the Transportation Act of 1940, to recognize the importance of barge transportation and require the railroads to give the same consideration in switching charges, proportional rate applications and divisions of joint through rates to ex-barge traffic as is given to ex-rail traffic.

TRANSPORTATION POLICY LEGISLATION

We advocate full development of the Mississippi valley inland waterways system for commercial navigation to the fullest extent consistent with economic justification.

We oppose H.R. 985 or any other legislation that would put the entire authority for transportation matters in the hands of the executive department of the government by taking the authority for the appointment of certain boards away from Congress. The transportation needs of this country can better be served by existing bodies such as the Interstate Commerce Commission and others.

WATERWAY TRAFFIC CONGESTION

We recognize that particularly in the last five or ten years the greatly increased number of pleasure boats using our inland rivers has brought about increasingly serious problems to themselves and commercial towboat operators. We believe these problems can be solved by a willingness on the part of all users of the rivers to cooperate one with another, and by an understanding of how this cooperation can be achieved.

We recognize the creation of the National Safe Boating Committee in which all elements of commercial operations and pleasure craft operations are represented to accomplish the foregoing purposes and endorse the program and activities of this Committee.

POLLUTION CONTROL

WATER POLLUTION

America's water pollution control program must recognize the multi-purpose nature of our water resources. Over-use for any single purpose may have a detrimental effect on one or more of the other uses. Therefore, there must be a balanced approach to the control of pollution, recognizing that, while the carrying of treated waste is an essential use of our streams, many other interests share in the use of our vital water resources.

Pollution control is aided by increased low-flow regulation in our streams. This low flow can be augmented by Congress providing for it on a non-reimbursable benefit basis.

We recognize the problems of salt water intrusion of streams in the coastal regions and the alkali problems of the inland streams, and we urge Congress to provide the necessary funds to continue studies toward a satisfactory solution.

We urge Congress to enact laws which will provide optional accelerated amortization of the costs of industrial waste facilities.

We strongly recommend that Congress appropriate sufficient funds to the

Public Health Service to accelerate its present water control program, and encouragement be given to state pollution control agencies, thereby enhancing the future water resources of our nation.

We urge state legislation to permit private companies to construct and operate sewage systems for the protection of the people served as well as for the protection of the companies involved and thereby encourage private enterprises to participate fully in the area of water disposal and stream pollution control.

AQUATIC PLANT INFESTATION

Water hyacinth and aquatic plant infestation has spread tremendously into the tributary waters of our principal streams.

Clogging of waterways has become extensive, often blanketing a long stretch of water course from bank to bank. Present authority for the destruction and removal of these harmful plants by the Corps of Engineers is limited to certain navigable waters so far as they constitute an obstruction to navigation.

We urge that federal authority for control and progressive eradication measures be extended in the interest of navigation, flood control, pollution abatement, drainage, agriculture, fish and wildlife conservation and public health.

RECOMMENDATIONS ON SPECIFIC PROJECTS

ARKANSAS RIVER BASIN

COMPREHENSIVE PROGRAM

We commend the 85th Congress for appropriating funds to continue construction of this important comprehensive project.

We urge Congress to make further appropriations sufficient to expedite the authorized program in the Arkansas River basin for flood control, bank stabilization, navigation, water supply and incidental hydroelectric power.

We request that increased appropriations be made as rapidly as the Corps of Engineers can handle such funds in order to bring about the completion of this program by 1972.

We call to the attention of Congress the importance of *Keystone*, *Eufaula* and *Oologah Dams* in Oklahoma, emphasizing the need for early completion of these projects so that *Dardanelle Dam* (now under construction) and *Ozark Dam* in Arkansas may be constructed on schedule.

We urge that the ban on new starts be lifted in the case of *Council Grove Dam* on the Neosho River and the *Elk City* (Table Mound) *Dam* on the Elk River in Kansas, and that sufficient construction funds be appropriated to get these projects under way. Floods in 1957 clearly demonstrated the serious deficiency of flood control storage on these streams.

We also request that additional funds for bank stabilization be appropriated so that work can be initiated on the reach of the Arkansas River between *Wilson's Rock* and the *Short Mountain Dam* site. During the 1957 floods, a natural cut-off, approximately on the line of the planned project, occurred in this area. If the bank stabilization program here can be initiated promptly, it will be possible to take advantage of this situation and to make a substantial saving in this portion of the work.

It is essential that work on the bank stabilization and navigation features from Fort Smith, Arkansas downstream, beginning at the mouth of the Arkansas River, be prosecuted simultaneously with work on the upper reaches as rapidly as possible to secure the earliest possible return of benefits.

We urge Congress to provide adequate funds to continue planning of badly needed projects in Kansas, Oklahoma and Arkansas so that the benefits may be made available at the earliest possible time. We emphasize that the Arkansas River is the only major river in the nation undeveloped for navigation.

OKLAHOMA WATER SUPPLY

We urge that additional funds be provided the Corps of Engineers to expedite the survey now under way, on the engineering and economic feasibility of combining the movement of large volumes of surplus water for municipal, industrial and agricultural uses from southeastern Oklahoma into central Oklahoma with an extension of the authorized navigation project on the Arkansas River.

COOSA-ALABAMA RIVER BASIN

The Coosa-Alabama River system is the largest and longest undeveloped river for navigation in the Southeast, having a length of 587 miles from Rome, Georgia to the mouth. The commercially tributary area of the basin covers approximately 26,000 miles and contains a population of more than 1½ million people.

Development of navigation and incidental hydroelectric power in conjunction with the development of four power dams by the Alabama Power Company is economically justified as determined by the Corps of Engineers and has been authorized since 1945. The first dam is now under construction by the Power Company and the remaining three must be completed within approximately nine years, as required by the license.

On the basis of a recent report by the Corps of Engineers, which estimates that commodities to move over the waterway will total approximately 4½ million tons and provide transportation savings of more than $8½ million, we urge the appropriation of necessary funds to permit the Corps of Engineers to complete their planning on the initial lock and dam to be located at *Millers Ferry*, Alabama River, and to initiate construction at the earliest practicable date.

CUMBERLAND RIVER BASIN

BARKLEY DAM

We urge appropriation of funds to continue at an orderly and economic rate, the construction of *Barkley Dam* on the lower Cumberland River.

GREAT LAKES AREA

CALUMET-SAG IMPROVEMENT TO THE ILLINOIS WATERWAY

We commend Congress for appropriating funds to continue construction of the Calumet-Sag channel improvement and we urgently recommend that Congress continue to appropriate sufficient funds for its early completion.

The Calumet-Sag improvement will provide an adequate waterway connection between the Mississippi River inland waterway system and Lake Michigan. It will also serve the concentrated Calumet industrial district. Correction of the critical bottleneck at Calumet-Sag is of transcendant importance to the economy of the entire Mississippi Valley.

CALUMET-SAG HIGHWAY BRIDGES

We commend the 85th Congress for its action in authorizing the application of the Truman-Hobbs Act formula to the construction and reconstruction of the highway bridges crossing the Calumet-Sag channel.

CALUMET RIVER

We urge the immediate appropriation of total necessary construction funds for the replacement of the three railroad bridges over the Calumet River between Lake Michigan and Lake Calumet; also for the widening, deepening and straightening of the channel in this section of the river to the new authorized dimensions. This improvement is necessary to enable large, ocean-going vessels to utilize the existing Lake Calumet harbor facilities.

CHICAGO REGION FLOOD CONTROL & DRAINAGE SURVEY

We urge the early completion of the authorized survey for flood control and drainage in the Chicago region in Illinois and Indiana.

GREAT LAKES CONNECTING CHANNELS

We commend Congress for appropriating funds to deepen the connecting channels in the Great Lakes system to 27 feet and we urge the appropriation of sufficient funds to continue construction of these projects at an economical rate of progress. These improvements are necessary to permit the national utilization of the St. Lawrence Seaway.

GREAT LAKES HARBOR SURVEY

We urge Congress to continue appropriations to complete the survey of the practicability of deepening harbors on the Great Lakes to a depth of 27 feet, and to authorize the deepening of all harbors where economically justified.

LAKE MICHIGAN DIVERSION

We are opposed to any decrease in diversion of water from Lake Michigan into the Illinois Waterway and we urge passage of legislation now in Congress to increase temporarily the presently authorized diversion of Lake Michigan water at Chicago from 1500 to 2500 cubic feet per second.

GULF COAST AREA

GULF-INTRACOASTAL WATERWAY LOUISIANA & TEXAS

We urge that studies now being made by the Corps of Engineers on the widening and deepening of the Gulf-Intracoastal Waterway west of New Orleans be expedited.

MATAGORDA SHIP CHANNEL

We urge the present session of Congress to appropriate funds to provide deep water access from the Gulf of Mexico through Pass Cavallo across Matagorda Bay to Point Comfort, Texas.

ILLINOIS RIVER BASIN

DUPLICATE LOCKS

Delay in the authorization of duplicate locks on the Illinois Waterway, as suggested by the Bureau of Budget, will seriously curtail the ability of the Waterway to handle forseeable traffic. Continued tonnage growth at the present rate will produce traffic exceeding the design capacity of the existing locks in the near future. This is particularly true since the Illinois Waterway is the connecting link between the Mississippi River system, the Great Lakes and the St. Lawrence Seaway. We urge Congress to authorize this project immediately so as to avert the necessity of an excessively expensive crash program at a later date.

FLOOD CONTROL

We urge early approval by the Corps of Engineers and the Bureau of the Budget and early authorization by Congress of the *Comprehensive Flood Control Program* for the Illinois River basin.

KANKAKEE RIVER BASIN

We urge the Corps of Engineers to complete its comprehensive report on the Kankakee River basin.

TRIBUTARY STREAM PROJECTS

We urge continued work on the levees east of Chandlerville on the Sangamon River and the river outlet.

We urge the early completion of authorized levee and drainage projects in the basin.

We urge continued appropriations for the *Beardstown Flood Protection Project.*

TWELVE FOOT CHANNEL

We urge the completion of a study to determine the feasibility of a twelve foot channel on the Illinois Waterway.

LOUISIANA — NAVIGATION PROJECTS

ATCHAFALAYA BAY SHIP CHANNEL

The existing project for navigation from Morgan City to the Gulf of Mexico is inadequate for present day needs, particularly in consideration of the offshore oil exploration and production activities in the Gulf of Mexico served by the Morgan City-Berwick area. We urge completion of authorized studies to modify the existing project to provide a ship channel from Morgan City through Atchafalaya Bay to the Gulf of Mexico with dimensions not less than 30 feet deep and 400 feet wide.

BARATARIA BAY WATERWAY

Originally improved many years ago for small fishing vessels, this waterway can no longer accommodate the volume and size of craft used by the offshore oil and fishing industries. We urge continued appropriations to complete planning and construction of the project in an orderly manner.

BATON ROUGE HARBOR

We commend Congress for appropriating funds for completion of the first two and one-half miles of the *Devil's Swamp Barge Canal* at Baton Rouge and urge that early consideration be given to completion of the remainder of the project.

CALCASIEU RIVER AND PASS

We urge that the Corps of Engineers expedite studies now being made on a modification of the navigation channel on the Calcasieu River below Lake Charles.

SHIP CHANNEL — MISSISSIPPI RIVER BATON ROUGE TO THE GULF

We recommend that sufficient funds be made available by Congress for the provision and maintenance of the authorized 40 foot channel depth between New Orleans and the Gulf of Mexico.

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We urge the appropriation of sufficient funds to complete the authorized examination and survey for modification of the project between Baton Rouge and New Orleans to provide adequate channel depths and widths and further urge that studies now being made be expedited.

FRESHWATER BAYOU NAVIGATION CHANNEL

We urge that studies be expedited on a navigation channel from the Gulf Intracoastal Waterway to the Gulf of Mexico in the vicinity of Freshwater Bayou so that this project may be considered for authorization during this session of Congress.

LAFOURCHE WATERWAY

We urge the early authorization of the *Lafourche Waterway* in southern Louisiana so that this project may be considered for authorization during this session of Congress.

MISSISSIPPI RIVER GULF OUTLET

We commend Congress for recognizing the urgency of this important project by its past appropriation of construction funds. We urge continued annual appropriations so that the project may be completed as rapidly as sound and economical engineering methods will permit.

We urge the support of pending legislation which will permit construction of a crossing of the project channel at Paris Road of such a type as will permit the unobstructed flow of both land and water traffic, in lieu of the presently authorized limited clearance highway crossing.

PORT ALLEN — INDIAN VILLAGE ALTERNATE ROUTE

We urge the appropriation of adequate funds for the continued construction of the *Port Allen-Indian Village Alternate Route* of the Plaquemine-Morgan City route of the Gulf Intracoastal Waterway.

MISSISSIPPI RIVER BASIN (UPPER)

DES MOINES RIVER

We recommend that Congress appropriate planning funds for the engineering and design of the *Saylorville Dam* on the Des Moines River in Iowa.

We urge Congress to appropriate funds for the completion of design and the start of construction of the *Red Rock Dam* on the Des Moines River in Iowa.

DUBUQUE ICE HARBOR

We urge the authorization and appropriation of funds by Congress for the dredging of the *Dubuque Ice Harbor.*

FLOOD CONTROL

We urge Congress to appropriate sufficient funds to make an over-all plan to control floods on the upper Mississippi River, giving due consideration to adequate conservation of fish and wildlife, and that this plan not interfere with the immediate completion of present studies being made on the upper Mississippi River.

LEVEE PROJECTS

We renew our endorsement of authorized levee projects in Missouri, Illinois, Iowa and Minnesota.

TRANS-ILLINOIS CANAL

In view of the contemplated changes in the upper Mississippi River traffic pattern, because of the St. Lawrence Seaway development, we urge that Congress authorize a new survey of the economic feasibility of a new canal between the Illinois and Mississippi Rivers.

MINNEAPOLIS UPPER HARBOR

We urge Congress to continue to appropriate funds for the speedy completion of the *St. Anthony Falls Extension Project* to provide a 9-foot channel to the north city limits of Minneapolis which, with the Minnesota River Navigation Project, will stimulate and aid the full utilization of low cost transportation by the people of Minnesota.

MINNESOTA RIVER

We urge the appropriation of funds for the construction of the authorized *Minnesota River Navigation Project* which, with the completion of the Minneapolis upper harbor, will stimulate and aid the full utilization of low cost transportation by the people of Minnesota.

NAVIGATION PROJECT, OHIO RIVER TO MINNEAPOLIS-ST. PAUL

We urge Congress to appropriate funds to investigate the advisability of

providing a 12 foot channel on the Mississippi River from the mouth of the Ohio River to Minneapolis-St. Paul.

RED WING HARBOR

We urge Congress to authorize the enlargement of the *Red Wing Harbor* in Minnesota as recommended by the Corps of Engineers.

ST. PAUL & SOUTH ST. PAUL FLOOD PROTECTION

We urge the prompt construction of the *Flood Protection Project for St. Paul and South St. Paul, Minnesota* as authorized in 1958.

WINONA FLOOD PROTECTION

We urge Congress to appropriate such funds as may be requested by the Corps of Engineers for the *Winona, Minnesota Flood Protection Project* as authorized in 1958, so that construction may be commenced at an early date.

MISSISSIPPI RIVER BASIN (CENTRAL)

BIG MUDDY AND BEAUCOUP CREEK

We urge the Corps of Engineers to expedite its present study and survey of the *Big Muddy River and Beaucoup Creek Canalization Project* in southern Illinois.

DAM TWENTY-SEVEN

We commend Congress for authorizing and providing funds for *Dam Twenty-Seven* near Alton, Illinois, and urge the continued appropriation of funds to complete this urgently needed remedial work to assure the availability of the 9 foot project depth over the lower sill of the Alton Lock.

KASKASKIA RIVER BASIN

We urge Congress to appropriate the entire amount recommended in the budget for the *Carlyle Dam.*

Progress on the other component units of the over-all program for the Kaskaskia River should not be delayed. We urge Congress to appropriate $125,000 to initiate planning of the *Shelbyville Dam* and $20,000 for planning for the *New Athens Flood Wall.*

We urge the expeditious processing of the Kaskaskia River navigation report and prompt action in accordance with the findings and recommendations therein.

JOANNA DAM

We urge Congress to appropriate planning and construction funds for the *Joanna Dam* on the Salt River in Missouri.

MAD CREEK PROJECT

We urge Congress to appropriate additional construction funds for the *Mad Creek (Muscatine, Iowa) Flood Protection Project.*

MERAMEC RIVER

We urge Congress to appropriate the sum of $150,000 to enable the Corps of Engineers, in cooperation with interested state and local agencies, to update their studies of the presently authorized dams on the Meramec River and its tributaries.

MUSCATINE BOAT HARBOR

We urge Congress to appropriate additional construction funds for the completion of the *Muscatine Boat Harbor* in Iowa.

MUSCATINE ISLAND LEVEE

We urge that Congress appropriate planning and construction funds for the *Muscatine Island Levee District #13.*

NAVIGATION PROJECT CAIRO TO ST. LOUIS

We urge the appropriation of necessary funds as requested by the Corps of Engineers to complete as rapidly as practicable the necessary construction work for the nine foot navigation project on the Mississippi River between Cairo and St. Louis.

REND LAKE

We urge immediate federal review of the State of Illinois Rend Lake survey report followed by prompt and appropriate action in accord with the results of such review.

ST. LOUIS FLOOD PROTECTION PROJECT

We urge the appropriation of $4,200,000 as requested by the President for continuing work on this project in fiscal 1960, and also urge that the entire project be completed as quickly as possible.

MISSISSIPPI RIVER BASIN (LOWER)

FLOOD CONTROL

We urge that the Bureau of the Budget and Congress give greater recognition to the importance of flood control on the lower Mississippi River and its tributaries by making adequate annual appropriations for the work remaining to be done. Although started 31 years ago, the project is only 71% complete.

We recommend that further appropriations be so scheduled as to provide for completion of the project by 1965.

We urge the expeditious completion by the Chief of Engineers and consideration by Congress of the comprehensive review report of the *Mississippi River and Tributaries Project*, with a view to authorizing needed additional features and modifications therein.

Particularly, is it urged that a comprehensive program of bank stabilization be authorized for the portion of the River below Baton Rouge, Louisiana.

GREENVILLE, MISS. HARBOR

We urge Congress to make funds available for planning and construction of the authorized *Greenville Harbor Project*. The Greenville Port Commission, acting since the authorization, has already committed funds for required local participation.

OLD RIVER CONTROL

We are pleased and gratified with the progress being made on the *Old River Control Structure* which will prevent the capture of the Mississippi by the Atchafalaya. We are satisfied that the work proposed by the Corps of Engineers is adequate and will be prosecuted rapidly.

We urge continued annual appropriations in accordance with recommendations of the Corps of Engineers to secure its completion by 1965.

YAZOO HEADWATER PROJECT

We urge that adequate appropriations be made annually for the orderly completion of the *Yazoo River Headwater Project* and the *Big Sunflower River Project* in Mississippi.

YAZOO BACKWATER PROJECT

The largest unprotected area in the lower Mississippi valley is encompassed in the 831,000 acres in the Yazoo backwater. Although protection was authorized in the Flood Control Act of 1944, this rich agricultural area is still subject to the ravages of flood. We urge the rapid construction of the connecting headwater levees and the early initiation of the *Yazoo Backwater Project*, which is an extension of the main line levee, so this situation can be corrected in the shortest possible time.

ST. FRANCIS RIVER BASIN

In view of the serious losses caused by frequent headwater flooding, we urge continued appropriations for the construction of the authorized flood control and primary drainage outlets on the St. Francis river in Arkansas and Missouri.

CACHE RIVER BASIN

Continuing channel deterioration and increasing need for primary outlets bring about a critical need for construction of the authorized improvements in the Cache River basin in Arkansas and Missouri. We urge prompt appropriations.

MISSOURI RIVER BASIN

COMPREHENSIVE PROGRAM

We urge the acceleration and early completion of the entire comprehensive development program in the Missouri River basin.

We strongly urge Congress to make appropriations available, not only to carry out the orderly and prompt completion of the flood control and water conservation projects already authorized by Congress, but also to make funds available to the Corps of Engineers, the Bureau of Reclamation, the Department of Agriculture and other appropriate agencies for the early completion of plans for additional projects necessary to realize the full benefits of flood control, navigation, irrigation, recreation, soil conservation and incidental hydroelectric power.

We support constructive programs designed to solve the Missouri River basin's particular problems of water pollution.

We heartily commend the Missouri Basin Inter-Agency Committee for the successful manner in which it has coordinated the work of responsible federal and state agencies in basin development. We oppose specific legislation which would modify the engineering and integrated functions of various projects as recommended by the Corps

of Engineers, the Bureau of Reclamation and other responsible agencies. We urge the fullest development of recreational facilities on all reservoirs.

AGRICULTURAL LEVEES

We urge Congress to accelerate completion of the authorized agricultural levees to protect 1½ million acres of Missouri River bottomland and public and private installations of an estimated value of $2 billion. We recommend adequate appropriations for the entire *Agricultural Levee Program* and that the Corps of Engineers be given discretion in determining the priority of projects.

BANK STABILIZATION

We urge Congress to accelerate appropriations for channel and bank stabilization work from Sioux City, Iowa to the mouth. We urgently recommend that Congress appropriate $6 million annually for work between Kansas City and the mouth of the River.

The loss of land by bank erosion from Sioux City, Iowa to Gavins Point Dam has increased since the closure and operation of the dam. We urge that funds be provided without delay for bank protection on this unimproved portion of the river.

We urge that flood protection facilities below the Kansas Citys, properly integrated with authorized flood control projects upstream, be constructed without delay.

LOCAL FLOOD PROTECTION

We urge the Corps of Engineers and the Soil Conservation Service to continue their cooperative efforts to work out a satisfactory flood protection project for *Indian Creek* in Iowa.

We urge Congress to appropriate sufficient funds for general surveys and plans to insure early completion by the Corps of Engineers, of a plan to protect *Atchison, Kansas*, a "disaster" community, from flooding of the White, Clay and Whiskey creeks and to appropriate money for the authorized agricultural levee flood wall at Atchison, and for raising the railroad bridge at this vital and strategic Missouri River crossing.

We urge Congressional appropriations for the authorized flood protection projects for the cities of *Abilene, Osawatomie, Ottawa, Salina, Topeka, Manhattan, and Lawrence, Kansas and Sioux Falls, South Dakota.*

We urge that adequate funds be provided promptly to complete the *Kansas City Flood Protection Project.*

MAIN STEM DAMS

The authorized dams and reservoirs on the main stem of the Missouri River at *Fort Peck, Garrison, Fort Randall, Gavins Point, Oahe* and *Big Bend* are completed or approaching completion.

We urge Congress to make appropriations to complete the dams under construction.

We recommend that, in designing the *Big Bend Dam*, provision be made for subsequent construction of a lock.

NAVIGATION CHANNEL

We recommend early completion of the authorized *nine foot channel* to Sioux City, Iowa, and are opposed to any restriction which might delay its early completion. We urge the completion of a survey report submitted in 1949 and returned for further study in 1951 by the Corps of Engineers on the engineering and economic feasibility of navigation above Sioux City, Iowa.

RECLAMATION

We urge Congress to appropriate funds for the completion of surveys on the *Oahe-James River Reclamation Project* in South Dakota.

We urge the uninterrupted construction of the *Ainsworth Irrigation Project* on the Niobara River in Nebraska.

We urge Congress to appropriate funds to start construction of the *Almena Unit* in Kansas. This project has met all government requirements including execution of repayment contracts with users of irrigation and municipal water.

We urge the commencement of construction of *Red Willow Dam* and reservoir. This is the last storage facility to be built in connection with the *Frenchman-Cambridge Unit* in Nebraska.

We recommend that Congress make possible full utilization of the completed *Cedar Bluff Dam* and reservoir in Kansas by appropriating funds to build the authorized irrigation facilities to serve lands of the *Cedar Bluff Irrigation District.*

We recommend that Congress appropriate funds to expedite completion of a definite plan report for *Glen Elder Unit* in Kansas.

We urge the Bureau of Reclamation to request and Congress to appropriate funds to expedite completion of a feasibility report on the *Little Blue Unit* in Nebraska in order to support a request for authorization.

GARRISON UNIT PROJECT

One of the principal benefits of the comprehensive Missouri River basin program is the development of further irrigation projects in the upper basin. We, therefore, urge Congress to enact appropriate legislation to construct the *Garrison Unit Project* if it finds that the project is sound and economically justified, after provision is made in the plan for the return of substantially all of the return flows of water from the lands irrigated into the Missouri river basin and, further, that appropriations therefor will not delay or retard appropriations for flood control reservoirs and other works within the basin necessary for the completion of the over-all plan for flood control in the basin.

TRIBUTARY STREAM PROJECTS

We urge Congress to continue appropriations for the construction of *Tuttle Creek Dam* in Kansas.

We urge the early authorization of the revised Kansas River basin report of the Corps of Engineers as a logical way to supplement the reservoir plan to impound enough flood water to give protection to the Kansas River valley against a recurrence of the 1951 flood.

We urge the early authorization of the *comprehensive program* for the *North Grand River* in Missouri, as incorporated in the North Grand River Report.

We urge that funds be appropriated for continued construction of the *Pomme de Terre Dam* in Missouri and the *Pomona Dam* in Kansas, and that sufficient planning funds be made available for the *Kasinger Bluff, Fort Scott, Melvern, Hillsdale, and Stockton Dams* in the *Osage River* basin in Missouri and Kansas.

We urge that early construction funds be made available for *Perry, Milford and Wilson Dams* in the *Kansas River* basin in Kansas.

We urge that additional planning funds be made available for the *Rathbun Dam* on the *Chariton River* in Iowa.

We urge Congress to appropriate final planning funds for the *Floyd River Flood Protection Project* so that construction of this urgently needed project can be started as soon as possible.

The proposed *Gering Valley Flood Control Project* and the *Salt Creek and Tributaries Project* in Nebraska have been authorized by Congress. It is urged that Congress promptly make appropriation of adequate funds for the construction of those projects.

We urge study and approval of a flood control program on the *James River* in North and South Dakota and on *Vermillion River* in South Dakota.

We recommend that funds be made available to the Corps of Engineers for an economic feasibility study of flood control dams and reservoirs on the *Platte River* in Missouri and the *Little Papio Creek* in Nebraska.

We urge the early completion of the *Bowman-Haley Project Report* in North Dakota.

We urge the Corps of Engineers to expedite its review report on the authorized *Pembina River Project* in North Dakota so that the project can be submitted to Congress.

OHIO RIVER BASIN

FLOOD CONTROL

We urge continued progress on the presently authorized *Ohio Valley Flood Control Program.* Construction should be expedited on the following flood control reservoirs now under construction: *Nolin and Rough River* in the *Green River* basin; *Sutton on the Kanawha River; Buckhorn on the Kentucky River, and Dillon on the Muskingum River.*

WATERWAY MODERNIZATION

We commend Congress for its interest in continued modernization of navigation facilities on the main stem of the Ohio River and urge that future appropriations be sufficient to complete this recanalization program no later than 1970. There is a vital need for preconstruction planning and engineering on five new Ohio River dams, namely *Belleville, Union Town, Canalton, Oppossom Creek and Racine.* We urge that funds be appropriated for these new planning starts in fiscal 1960.

TRIBUTARY STREAM PROJECTS

We urge the initiation of construction of the vitally important *Allegheny River Reservoir.* We request commencement of construction on the *Shenango Reservoir; Fishtrap and Pound Reservoirs* on the *Big Sandy River; No. 2 Barren Reservoir* in the

Green River Basin; on the *Summersville Reservoir* on the *Kanawha River; the Mahoning River Reservoir* on its west branch; and the *Muskingum River Reservoir.*

Advanced planning funds are requested for the *No. 2 Green River Reservoir.*

We urge continued progress on the modernization of navigation facilities on the Monongahela River with continued appropriations for *Hildebrand Locks and Dam, Maxwell Locks and Dam, Locks and Dam No. 8, Opekiska Locks and Dam,* and *Locks and Dam No. 4.*

WABASH RIVER BASIN

We urge the early completion of the investigation and survey to determine the feasibility of providing a commercial barge channel on the Wabash River.

We urge that Congress provide funds in the 1959-60 budget for advanced planning for the *Mississinewa, Salomonie* and *Huntington* flood control reservoirs in the upper Wabash River basin and the *Monroe* multiple-purpose reservoir on *Salt Creek,* a tributary to *White River* in the Wabash River basin, and the *Mason J. Niblack* and *Unit #5 Levee* on the Wabash River.

We recommend that funds be made available to the Corps of Engineers to complete at an early date the investigation and survey for flood control and other purposes in Illinois and Indiana of the Wabash river basin with particular attention to expediting the reports on the *Wildcat, Big Pine, Sugar Creek* and *Wolf Creek* flood control reservoirs and the local protection of *Mt. Carmel, Illinois.*

OUACHITA RIVER BASIN

CADDO RIVER

The multiple-purpose *DeGray Dam* on the Caddo River was authorized in 1950. It has full economic justification and a local water district has been formed to carry out the provisions of Title III of Public Law 85-500. Preliminary planning funds have been appropriated and expended and we now urge Congress to appropriate such funds as may be required to get construction started in fiscal 1960.

DRAINAGE CANALS

We urge Congress to provide the funds necessary to complete the present projects and to start construction on the master drainage canals in northeastern Louisiana and southeastern Arkansas, as authorized in 1958.

NAVIGATION

The Ouachita River in Arkansas and Louisiana is handicapped by a 6½ foot navigation channel and short, nonstandard size locks which are in poor condition but, nevertheless, has substantially increased its traffic. Congress authorized a modern 9 foot channel for this river in 1950. Since 1951, one year after this authorization, the ton-mile volume of traffic has increased 766.47 per cent. We urge Congress to provide such funds as may be needed to get this project under construction during fiscal 1960.

SALINE RIVER

Local interests have made necessary economic studies, held public hearings, formed an official water district under Title III of Public Law 85-500 and otherwise determined feasibility and the economic justification for the proposed multiple-purpose *Benton Dam* on the *Saline River* in Arkansas. We, therefore, urge Congress to make available to the Corps of Engineers, sufficient funds to bring this project into complete readiness for Congressional authorization.

TENNESSEE-TOMBIGBEE WATERWAY

The *Tennessee-Tombigbee Waterway* was authorized by Congress in 1946 after exhaustive studies and a favorable recommendation by the Corps of Engineers. Since that time, a great forward step has been taken in the completion of the lock at *Demopolis, Alabama* at the confluence of the Tombigbee and Black Warrior Rivers. A study to determine the present feasibility of the project has been completed by the Corps of Engineers but has not yet been made public. Based upon known factors, it is expected that the study will show the project to be feasible and economically justified. Subject to a favorable finding, we urge Congress to make sufficient funds available to conduct advance planning and to initiate construction as soon as possible.

WARRIOR-TOMBIGBEE WATERWAY

NAVIGATION

The *Warrior-Tombigbee Waterway* in Alabama is one of the oldest and fastest growing inland barge channels in southeastern United States. Traffic has more than doubled since 1949, reaching a record of 4,873,991 tons in 1957.

Demopolis and *Warrior Locks and Dams*, replacing six obsolete structures, have been completed. *Jackson Lock and Dam*, which will eliminate three small, inadequate structures in the waterway's lower reaches, is in its third year of construction and the present schedule calls for opening the lock to river traffic in the last half of 1960. We urgently request the appropriation of adequate funds to keep construction of this urgently needed navigation facility on schedule.

The next step in the Waterway's improvement is the construction of *Holt Lock and Dam* to replace four small, low-lift locks and dams in the upper reaches near the city of Tuscaloosa. Construction of *Holt Lock and Dam* has been authorized by the Secretary of the Army. We urge the appropriation of funds sufficient for the necessary advance planning in order that construction of the project may begin at the earliest possible date.

UPSTREAM DEVELOPMENT

In addition to the needed navigation structures, we recognize the need for full development of the headwaters of the *Warrior-Tombigbee Waterway* to relieve costly annual floods as well as to provide this highly industrial and agricultural river valley with a dependable supply of water for navigation, industrial, agricultural and domestic use, fish and wildlife conservation, pollution abatement and recreation.

RED RIVER BASIN IN TEXAS, OKLAHOMA, LOUISIANA, ARKANSAS

BANK STABILIZATION

We strongly urge immediate completion of the 1951 Senate resolution directing the Corps of Engineers to prepare a comprehensive bank stabilization program for the Red River.

FLOOD CONTROL

We recommend continued appropriations for the construction of the *Red River Comprehensive Flood Control Project* authorized by Congress in 1946.

NAVIGATION

We recommend appropriations for the construction of the 9 foot *Overton-Red River Waterway* from the Mississippi River to Shreveport, Louisiana authorized by Congress in 1946.

We recommend a survey of the Red River from Shreveport to *Denison Dam* and to Jefferson, Texas for the purpose of determining the economic value of a 9 foot channel for barge navigation.

TRINITY RIVER BASIN

We endorse the *comprehensive program* for the *Trinity River Basin* in Texas, including navigation, and urge that construction funds be provided so that work by the Corps of Engineers and the Soil Conservation Service may be continued.

WHITE RIVER BASIN

COMPREHENSIVE PROGRAM

We urge Congress to recognize that comprehensive development of the *White River* basin, as recommended by the Corps of Engineers and partially authorized by Congress, will return substantial benefits in flood control, bank stabilization, recreation and incidental hydroelectric power.

We urge Congress to appropriate $11,130,000 as recommended by the Budget for the construction of *Greer's Ferry Dam* on the *Little Red River* in Arkansas.

We urge that Congress make appropriations sufficient to begin construction of the *Beaver Dam* on the *White River* in Arkansas.

We urge the early construction of the *Lone Rock Dam* on the *Buffalo River* and that studies be made concerning the feasibility of including hydroelectric power.

NAVIGATION

We urge the Corps of Engineers to make a restudy of the navigation possibilities on the lower *White River* from Batesville to the mouth.

Senator ELLENDER. Mr. Chairman, as I previously mentioned to you, the Louisiana Department of Public Works, in an effort to coordinate this hearing, got in touch with representatives of each interest involved. In this case, navigation, Col. William H. Lewis was asked to coordinate the presentation of the testimony. We now call Col. William Lewis, planning coordinator, port of New Orleans. All right. Colonel Lewis, you may proceed.

STATEMENT OF COL. WILLIAM H. LEWIS, PLANNING COORDINATOR, PORT OF NEW ORLEANS

Colonel LEWIS. Mr. Chairman, and members of the Senate Select Committee on National Water Resources, it is my privilege to appear before you in behalf of the navigation interest of Louisiana.

I am William H. Lewis, planning coordinator for the Board of Commissioners of the Port of New Orleans. I appear in a dual role, that of presenting the overall navigation requirement in Louisiana and of coordinating the presentation of other similar interests, both from within and without the State and also to represent the port of New Orleans itself.

I have submitted to you a brief, within which you will find a summary of the existing navigation projects within the State and within which you will find a program for future navigation developments.

At the outset I would like to invite the attention of the committee to the significance of Louisiana and its waterways in relation to the navigable waterways of the United States and you will find within this brief a map (see footnote, p. 2477) on which is indicated the major navigable waters of the United States and you may find it convenient to refer to that, the last map in the brochure.

Louisiana lies in an unusually unique and strategic position in relation to our navigable water. Lying entirely within the State boundaries is 500 miles of the Mississippi River channel and, more importantly, the mouth of the Mississippi which forms the main stem of a vast network of inland waterways comprising approximately 12,000 miles of developed waterways, including the important tributaries of the Ohio, the Illinois, the upper Mississippi, the Missouri, the Arkansas, the Red, the Ouchita and other minor streams.

This system has afforded since the early days of our Nation's history a main access to the interior of the United States and a major avenue of commerce for products, raw materials, moving to and from the markets of the United States and of the world.

In addition to the position of Louisiana in relation to this inland waterway system, we have a unique position in relation to the sealanes of the world. Louisiana lies at the midpoint of the gulf area; within the State are three major world ports, at Lake Charles, Baton Rouge, and New Orleans. Two of these stand among the largest eastern ports in the United States. New Orleans is the second largest port from the viewpoint of dollar value of export and import.

Louisiana also provides an important crossroads of other waterways, including the gulf, of intercoastal waterways extending from Brownsville, Tex., to St. Marcus, Fla.; that system extending some 1,200 miles along the gulf coast passes for 300 of those miles through the State of Louisiana.

It is not only the presence of these waterways within the State but their interrelationship that play an important role in the overall navigation picture.

So much for the national significance of Louisiana and its waterways.

You will also find in this brochure a map indicating the existing waterway projects within Louisiana, including those developed for navigation.

You will find that there are some 44 navigation projects which have been authorized by Congress and are underway under the supervision of the Corps of Engineers.

Some 30 of these essentially are completed, another 10 are under construction, and 4 others have not yet been started.

Mr. Myers in his presentation has reviewed with you the status and the location of many of those. The projects pertaining to navigation are indicated on the map by a circle within which there is a number, which number refers to the index on the upper right-hand corner of the map.

It may be assumed from this extensive system that our waterway requirements for navigation are essentially met. I wish, however, to present to you the future requirements which indicate clearly and definitely that that is not the case. The trends in our economy we believe dictate continuation of the national policy for the progressive development of our waterways to meet our future needs. These needs are being developed by the growth in our population, the corresponding growth in commerce, and in industry.

Attending this growth are technological changes in navigation, both oceangoing and inland, which dictates the development of larger and faster vessels. The Maritime Commission in its replacement program is developing oceangoing vessels of greater draft, of greater length, and of greater speed.

Similarly, the inland-waterway carriers are through technological changes increasing the size of their vessels, both as to depth, as to length, and as to power and speed.

These dictate increased improvments in our waterways so as to permit the passage of navigation in greater volume and at greater speed with greater efficiency and with lower cost.

Attending these developments is the need for additional port and terminal facilities for which some additional waterway development is required and there is an increasing demand for waterfront sites by industry which also contributes to the need for additional waterway development.

For the benefit of the committee, I would like to summarize the requirements for these developments as we foresee them in Louisiana and I would find it most convenient to refer to the map prepared by the Department of Public Works. I believe I may be heard over there if I have the committee's permission.

Within the future requirements of the State of Louisiana for navigation we see the need not only for improving Southwest Pass, now under construction, and the upper reach of the river from New Orleans to Baton Rouge for deep-draft navigation to 40 feet but in the long range to see the need for an additional deepening of this portion of the Mississippi River to 45 feet to accommodate the supertankers

and super cargo carriers that appear to be coming in the vessel construction program.

Above Baton Rouge on the Mississippi we foresee not only the need for completion of the existing project providing the depth of 12 feet but the need for further deepening of the river to provide a low-water channel having a depth of from 18 to 20 feet up to Cairo. This need is dictated by the developments of vessels requiring the greater depth and possibly the development of an intermediate-type vessel which would enable the transportation of bulk cargo from overseas points upriver without the necessity of transloading that cargo from deep-draft to shallow-draft vessels.

Attending the developments along the Mississippi River we look for the early completion of the Mississippi River gulf outlet which will provide an additional deep-draft channel to the port of New Orleans and the completion of an additional lock connection between that channel and the Mississippi River in the vicinity of Violet.

Presently there is a deep-draft lock connection between the Mississippi River and the industrial canal which is some 40 years old and has reached its practical capacity.

For navigation with the opening of this waterway we see the immediate need for an additional lock connection having adequate dimensions to handle the increased tonnage and size of vessel.

We would look for the early completion of the authorized Barataria Waterway and the completion of the authorized Bayou Segnette Waterway and in the long range could foresee the need for the further deepening of this waterway system to the Mississippi River to provide an additional deep draft channel both for commerce and navigation.

And to provide waterfront site for industry, as Mr. Myers pointed out, we look for the early completion of the Lafourche-Jump and Lafourche Waterway project to their authorized dimensions, the Houms navigation canal being constructed by State interest we consider should be adopted within the Federal program and the Federal Government should assume responsibility for the maintenance of that channel.

We look for the early maintenance of the authorized project from Morgan City to the gulf to a depth of 14 feet and foresee the need for deepening and widening that waterway as a deepwater channel, minimum depth of 35 feet to afford access by ocean going vessels.

Attending that we look for the early completion of the authorized Port Allen-Morgan City alternate route of intercoastal waterways and could foresee in the long range a need for the further deepening of that waterway to provide access by oceangoing vessels to the industrial completion developing between Port Allen and Plaquemine.

We look for the further deepening of the Atchafalaya River in dimensions commensurate with that proposed for the Mississippi River to the depth of 18 to 20 feet, again to more easily accommodate our inland-waterway transportation.

As has been mentioned, we look for the early completion of the fresh-water bayou project and in the long range the deepening of the fresh-water bayou and the Vermilion River completion to provide a depth of 18 feet from the gulf to Lafayette.

We look immediately for the deepening of the Calcasieu River and Pass project and subsequently to the deepening there to 45 feet, again to accommodate the larger vessels.

And running along the route of the present intercoastal waterway we look for an improved project having a depth of 18 feet in the near future and in the long range the development of an extensive industrial canal capable of accommodating oceangoing vessels.

We would seek for the early realization of navigation on the Red River from Old River to Shreveport and subsequently an extension of that waterway to Texarkana, Tex., to Daingerfield, Tex. That should provide a minimum channel of 9 by 100 initially and subsequently should be developed as a primary waterway.

We look for the early completion of the Black-Ouachita navigation project initially to a depth of 9 feet and subsequently to a depth of 12.

We submit these, gentlemen, to you as the long-range program without regard to the time within which any one of these projects would be completed or without regard to establishing a priority, those to be determined as a requirement for each is manifest.

In closing I would like to submit that navigation projects in Louisiana are entirely consistent with other water improvements. Navigation is a nonconsumptive user of water. The channels afforded for navigation also serve as reservoirs for fresh water and it is a tributary for that water which is needed by agriculture and industry.

We realize that in the development of these projects I have outlined safeguards should be provided within them to prevent the intrusion of salt water from the gulf into the existing surface and underground water sources.

We believe, however, that the development of this program I have outlined is entirely consistent with these other requirements and that they may be developed concurrently.

I would like to present two problems which I believe lie within the scope of national policy, attending these waterway developments. The first is the need for a policy guiding the construction of bridges over our waterways. We sense a trend whereby the development of our highway system is hampering the future development of our waterways. We believe that the requirements of navigation are being overlooked in many cases and that unrealistic standards are being imposed on our waterways by other interests.

Next, if we are to realize a future growth in our navigable waterways, we believe some means must be adopted whereby the rights-of-way for these new developments may be reserved for future use, and to suggest somewhat similar to the policy adopted for satisfying future water supply requirements there may be a national policy adopted whereby the local interest normally responsible for these rights-of-way may be assisted through an advance or a loan at reasonable rates over a long period of time whereby these financial obligations may be met and that the future developments for our waterways may be realized.

I thank you for your attention and I would like to call upon the others who appear now in behalf of navigation.

Senator ELLENDER. Thank you, Colonel.

(The prepared statement of Colonel Lewis is as follows:)

STATEMENT OF COL. WILLIAM H. LEWIS, PLANNING COORDINATOR, PORT OF NEW ORLEANS

WATER RESOURCES DEVELOPMENTS FOR NAVIGATION

Mr. Chairman and members of the Senate Select Committee on National Water Resources, it is a privilege to present to your distinguished committee this statement on water resources developments for navigation in Louisiana.

I am William H. Lewis, planning coordinator for the Board of Commissioners of the Port of New Orleans. I appear before your committee in a dual role: first, in presenting an overall picture of navigation in Louisiana, and of coordinating the submission of testimony of all State nevigation interests; second, in representing the port of New Orleans. My presentation will submit for your consideration the status of present projects in Louisiana and the requirements for future waterway projects for navigation to serve the indicated potential of commerce and industry. This will be followed by the submission of testimony by other individuals representing various navigation interests, both from within and outside of the State.

Louisiana lies in an extremely unique position in relation to the inland waterways of the United States and the maritime ports of the world. Geographically, the State lies in an unusually important and economically strategic location in relation to the land areas and river basins of the midcontinent area comprising the Mississippi River Valley. Furthermore, it is centrally located on the Gulf of Mexico and is favorably oriented to the international areas of Central and South Americas, the countries of south Europe and the Mediterranean, and the continent of Africa. The ports of Louisiana provide major terminals for foreign and coastwise trade.

MAJOR WATERWAYS OF LOUISIANA

The streams of Louisiana provide 7,500 miles of navigable waterways, of which 2,200 are maintained and used as regular arteries of commerce. The importance of these waterways in Louisiana to navigation is emphasized by the relationship of each to the other, and the extensive interconnected transportation system that is created by the combination of these streams and waterways which serve beneficially the commerce and navigation not only of the State but of the entire Nation.

The Mississippi River courses along or within the boundaries of Louisiana for a distance of 518 miles. The mouth of the river and 325 miles of its channel lie entirely within the State. Connected to the Mississippi via Old River is the Atchafalaya River, serving as an important channel for navigation as well as a distributary of floodwaters from the Mississippi. The Atchafalaya extends through Louisiana for 140 miles.

Other major natural streams include the Ouachita-Black River system flowing through Louisiana for a distance of 120 miles, joining the Red River and flowing utlimately into the Atchafalaya River. The Red River cuts diagonally through Louisiana from the northwest corner to a junction with the Atchafalaya River near Simmesport, La., a distance of 370 river miles. Lying on the western border of Louisiana is the Sabine River. Along the coastal areas of Louisiana are numerous rivers and bayous of importance including: Calcasieu River, Mermentau River, Vermilion River, Bayou Teche, lower Atchafalaya River, Bayou Terrebonne, Bayou Lafourche, and Bayou Barataria. Pearl River marks the State's eastern boundary. In addition to these natural streams, the most important manmade navigation channel in the United States, Gulf Intracoastal Waterway, extends across the entire width of Louisiana from Orange, Tex. to the Rigolets, a distance of 302 miles. Now under construction is the Mississippi River-gulf outlet extending from the port of New Orleans to the Gulf of Mexico for a distance of 76 miles.

MISSISSIPPI RIVER

Of these streams, most important to the State as well as to the Nation, is the Mississippi River itself. From the earliest days, the Mississippi River has provided a means of transportation by which the early explorers and settlers of our country could enter the vast midcontinent area. Since early in our Nation's history, the Mississippi River was afforded a means by which the products of

our farms and industries could be transported at low cost to the markets of domestic and foreign trade.

The Mississippi River is the main stem of a 12,000-mile system of inland waterways over which the Nation's commerce flows in ever-increasing quantities. This giant waterway system includes the Illinois, Ohio, Allegheny, Monongahela, Cumberland, Tennessee, Arkansas, Red, Ouachita, and Atchafalaya Rivers, and many others of lesser importance. Since the turn of this century, the Mississippi River has served as well in its lower reaches as the largest natural seaport in the world. Oceangoing transportation may enter the river at its mouth through South and Southwest Passes, and may proceed upstream through the port of New Orleans as far as Baton Rouge, a distance of 250 miles from the Gulf of Mexico.

During 1958 the Mississippi River system carried almost 210 million tons of commerce, including 172.5 million tons of inland traffic and 37.3 tons of foreign and coastwise traffic. Of this, 112.6 million tons were carried on the Mississippi River from Minneapolis, Minn., to the mouth of the river. The stretch from Cairo, Ill., to Baton Rouge carried 30.8 million tons, the stretch from Baton Rouge to New Orleans carried 47.4 million tons, and the stretch from New Orelans to Mouth of Passes carried 70.4 million tons. Traffic at the port of Baton Rouge in 1958 amounted to 20.9 million tons and at the port of New Orleans totaled 51.7 million tons. These imposing figures stress the importance of Louisiana ports and waterways in relation to the overall Mississippi River system.

MISSISSIPPI RIVER-GULF OUTLET

The Mississippi River-gulf outlet now under construction will afford an important deepwater link between the Mississippi River and the Gulf of Mexico. This channel being constructed to a depth of 36 feet and a width of 500 feet will provide an alternate route from the port of New Orleans to the sealanes of the world, eliminating some of the hazards of navigation on the Mississippi River and affording a means for expanding the port of New Orleans and of serving industry with waterfront sites.

INNER HARBOR-NAVIGATION CANAL

The Inner Harbor-navigation canal, connecting the Mississippi River and Lake Pontchartrain with a length of over 5 miles, will also serve to connect the river and the gulf outlet. The canal carried 6,049,025 tons of traffic in 1958.

GULF INTRACOASTAL WATERWAY (GIWW)

Intersecting the Mississippi River at New Orleans is the Gulf Intracoastal Waterway which extends from Brownsville, Tex., through Louisiana to St. Marks, Fla., for a distance of over 1,200 miles. This entire waterway has netted to the Nation's economy many times its orginal cost. The rich resources of the gulf area including petroleum, sulfur, and salt are transported over this waterway to connect with the Mississippi River system enabling delivery by low-cost barge transportation to the upper reaches of the Mississippi, the Ohio River Valley, the Missouri, and the Great Lakes area. Cargoes reached the GIWW in Louisiana through such feeder streams as the Calcasieu, Mermentau, and Atchafalaya Rivers, the Barataria and Bayou Segnette Waterways, Bayous Terrebonne, Teche, and Lafourche, all in Louisiana.

In 1958 the GIWW carried over 46 million tons of commerce. Of this total, 31.2 million tons were carried in the stretch from the Sabine River to the Mississippi River and over 7 million tons were carried for the stretch from Mobile, Ala., to New Orleans, La. Again the importance of the stretch of this waterway in Louisiana in relation to the overall activity of navigation is evident.

ATCHAFALAYA BASIN WATERWAYS

Of major importance to the Gulf Intracoastal Waterway is the alternate route from Morgan City to Plaquemine, and the extension to Port Allen, La. Also of major importance is the connection of the GIWW with the Atchafalaya River which serves as an alternate route to the Mississippi above Baton Rouge. The Atchafalaya River below Morgan City provides an important connection with the Gulf of Mexico.

The alternate route from Morgan City to Plaquemine carried about 2.9 million tons of commerce in 1958. In the same year the Atchafalaya River carrier 4.9

million tons from Morgan City to the Mississippi River. The Atchafalaya River from Morgan City to the Gulf of Mexico carried 2.4 million tons in 1958.

CALCASIEU RIVER AND PASS

The Calcasieu River and Pass affords a deep-draft channel and harbor for the port of Lake Charles. Petroleum, petrochemical, and other major industries are served importantly by this waterway which in 1958 carried 15.4 million tons of commerce. The Lake Charles deep-water channel joining the Calcasieu River carried about 17.2 million tons of commerce.

OTHER WATERWAYS

Other waterways in Louisiana on which statistics of foreign and domestic commerce are recorded and available are indicated on the following table:

Freight traffic, 1958

Waterway:	*Tons*
Chefuncte and Bogue Falia Rivers	42,859
Bayou Lacombe	102,891
Waterway from Empire to gulf	395,518
Barataria Bay Waterway	996,312
Boyou Lafourche	2,146,649
Bayou Terrebonne	1,463,692
Bayou Little Caillou	84,358
Boyou Le Carpe and Grand Caillou	397,931
Big Pigeon and Little Pigeon Bayous	143,075
Petit Anse, Tigre and Carlin Bayous	696,116
Bayou Teche	402,320
Waterway from Franklin to Mermentau River	426,928
Bayou Vermilion	419,427
Mermentau River	2,343,625
Vinton Waterway	48,891
Red River	295,265
Ouachita and Black Rivers	325,221
Other harbors and waterways	3,016,489

EXISTING NAVIGATION PROJECTS IN LOUISIANA

Mississippi River

Mississippi River, Baton Rouge to the Gulf of Mexico.—The existing project authorizes a channel for navigation from the mouth of Southwest Pass to the port of New Orleans at a depth of 40 feet, a distance of about 120 miles, and from the port of New Orleans to Baton Rouge at a depth of 35 feet, an additional distance of about 130 miles. The width of the authorized project varies from 500 feet between Baton Rouge and New Orleans, 1,500 feet within the port limits of New Orleans, and 1,000 feet from New Orleans to Head of Passes. South Pass provides a channel 30 by 450 feet. Southwest Pass will provide, when present work is completed, a channel 40 by 800 feet.

Mississippi River, Cairo, Ill., to Baton Rouge, La.—This project authorizes a channel of 12 by 300 feet at low water. Within, or bordering, the State of Louisiana this project extends for a distance of approximately 270 miles.

Mississippi River-gulf outlet.—This project, now under construction, provides for a channel 36 feet deep and 500 feet wide, extending for a distance of 76 miles from the inner harbor-navigation canal to the Gulf of Mexico, south of the Chandeleur Island chain. This project provides, subsequently, for construction of an additional lock and channel to connect with the Mississippi River in the vicinity of Violet. The deepwater channel coincides for a distance of approximately 5 miles with the existing channel of the Gulf Intracoastal Waterway, east of New Orleans.

Inner harbor-navigation canal and lock.—This is a State-owned project, developed by the Board of Commissioners of the Port of New Orleans, providing a 32- by 200-foot channel 5½ miles long connecting the Mississippi River with Lake Pontchartrain. The inner harbor-navigation canal lock provides a length of 640 feet, a width of 75 feet, and a depth of 31½ feet. This lock and a portion of the canal initially will provide the navigation connection between the Mississippi River and the Mississippi River-gulf outlet.

Waterways in Pontchartrain Basin

Amite River and Bayou Manchac.—The Amite River project provides for a channel 7 by 60 feet from Lake Maurepas to Port Vincent.

Tickfaw, Natalbany, Ponchatoula, and Blood Rivers.—This project provides for navigation improvements by removal of obstructions, the total length of improved waterways being about 45 miles.

Pass Manchac.—This project provides for improvements between Lake Maurepas and Lake Pontchartrain for a distance of 7 miles.

Tangipahoa River.—This project provides for improvement by snagging and clearing of about 54 miles above the mouth of the Tangipahoa River on Lake Ponchartrain.

Chefuncte River and Bogue Falia.—This project provides for a channel 10 feet deep from Lake Pontchartrain via Chefuncte River and Bogue Falia to Covington, La., a distance of about 14 miles.

Bayou Lacombe.—This project provides for a channel 8 by 60 feet through the entrance bar in Lake Pontchartrain and removal of snags for a distance of approximately 8 miles.

Bayou Bonfouca.—This project provides for a channel 10 by 60 feet from Lake Pontchartrain to Slidell, La., a distance of 9 miles.

Pearl River.—The existing project provides for a channel from the mouth of West Pearl River to Bogalusa, La., at a depth of 7 feet for a distance of 58 miles.

Bayou Dupre.—This project provides for a channel 6 by 80 feet from Lake Borgne to Violet, La., a distance of about 7 miles.

Bayous La Loutre, St. Malo, and Yscloskey.—This project provides for a channel 5 by 40 feet from Lake Borgne to Bayou Yscloskey, a channel 6½ by 40 feet from Lake Borgne through Bayous St. Malo, La Loutre, and Eloi to Lake Eloi, and a channel 5 by 30 feet in Bayou La Loutre between Hopedale and Bayou St. Malo.

Ostrica lock and canal.—This is a toll-free, State owned and operated project providing a connection with the Mississippi River through the east bank about 25 miles above Head of Passes. The lock structure is 220 feet long, 40 feet wide, with a depth of 10 feet. A dredged canal 12 by 80 feet connects the lock with natural waterways to the east for a distance of 1½ miles.

Gulf Intracoastal Waterway

The entire project for the Gulf Intracoastal Waterway extends from the Mexican border to Apalachee Bay, a distance of approximately 1,200 miles. That portion lying within Louisiana extends along the coast of the Gulf of Mexico from the Sabine River to the Rigolets on the eastern boundary of the State for a distance of 302 miles. The project provides a channel 12 by 125 feet from the Sabine River to the Mississippi River, and a channel 12 by 150 feet from the Industrial Canal to the Rigolets. Connections between the Intracoastal Waterway and the Mississippi River are provided on the west bank through Harvey and Algiers canals and locks, and on the east bank through the Industrial canal and locks.

Waterways from Mississippi River to Atchafalaya River

Empire Waterway.—This project provides for a channel 9 by 80 feet from the Gulf of Mexico to Empire, La., a distance of about 10 miles. Empire lock was constructed and is operated by the State. It has a width of 40 feet, a length of 200 feet, and a depth of 9.2 feet.

Barataria Bay Waterway.—A project recently authorized by Congress will provide for a channel 12 by 125 feet from the Gulf of Mexico, via Barataria Bay, to the Gulf Intracoastal Waterway, covering a distance of 37 miles.

Bayou Segnette Waterway.—Affording an extension of the Barataria Bay Waterway into the outskirts of Metropolitan New Orleans, on the east bank of the Mississippi River is the Bayou Segnette Waterway, having an authorized channel of 9 by 60 feet. The project is 12.5 miles long.

Bayou Lafourche Waterway.—A project recommended by the Corps of Engineers, and pending authorization by the Congress, is expected to provide a channel from the Gulf of Mexico to Leesville, a distance of 12 miles, and from Leesville to the Gulf Intracoastal Waterway by a new land cut for an additional distance of 28 miles. This project also is to provide for a waterway connection from Grand Isle to Leesville, a distance of 15 miles, and an extension of the existing waterway from Leesville to Golden Meadow, a distance of 8 miles.

The proposed project will provide for a channel of 12 by 125 feet. The existing project provides for a channel 6 by 60 feet from the Intracoastal Waterway to Napoleonville, a total distance of about 50 miles.

Bayous Grand Caillou and Le Carpe.—This project provides for a waterway 5 by 40 feet from the Intracoastal Waterway at Houma to Bayou Duloc, a distance of more than 16 miles.

Little Caillou Bayou.—This project provides for a channel 5 by 40 feet from Bayou Terrebonne to Robinson Canal, a distance of about 20 miles.

Bayou Terrebonne.—This project provides for a channel 6 feet deep from Bush Canal, 13 miles from the mouth of the bayou to Houma, La., a distance of about 24 miles.

Houma Navigation Canal.—A waterway project being developed solely at the expense of the State of Louisiana will provide a channel 16 by 150 feet, extending from the Gulf of Mexico to the Gulf Intracoastal Waterway at Houma, La., a distance of about 30 miles.

Atchafalaya Basin waterways

The Atchafalaya River is a tributary of the Mississippi River lying entirely within Louisiana, flowing from the Mississippi River through Old River, and from the confluence of Old and Red Rivers to Atchafalaya Bay, over a distance of 140 miles. This waterway provides a channel of 12 by 125 feet from the Mississippi River to the Intracoastal Waterway at Morgan City. The project for the lower Atchafalaya River from Morgan City to the Gulf of Mexico provides an authorized channel of 20 by 200 feet for a distance of about 16 miles.

Alternate route of Gulf Intracoastal Waterway.—An alternate route of the Gulf Intracoastal Waterway extends from Morgan City to the Mississippi River at Plaquemine with an extension to Port Allen where an additional lock connection is being constructed. The project provides for a channel 12 by 125 feet for a distance of 65 miles. The lock at Port Allen will be 84 feet wide, 1,200 feet long, with a depth of 14 feet, to be the largest lock in the Intracoastal Waterway system.

Waterways in Teche-Vermilion Basin

Bayou Teche.—This project provides for a channel 8 by 80 feet from the mouth of the stream to New Iberia, thence 6 by 60 feet to Keystone Lock, and thence 6 by 50 feet to Arnaudville, La. Outlets to the Gulf of Mexico are provided by the Charenton drainage canal and Wax Lake outlet, both being projects primarily for flood control.

Bayous Tigre, Carlin, and Petit Anse.—This project provides a channel 9 by 80 feet from the Intracoastal Waterway to Lake Peigneur, and a channel 5 by 40 feet from the Intracoastal Waterway to Vermilion Bay; the total length of improved channels is about 16 miles.

Fresh Water Bayou Waterway.—A project under consideration by the Corps of Engineers for improvement of Fresh Water Bayou is expected to provide for development of a channel 12 by 125 feet from the Gulf of Mexico to the Gulf Intracoastal Waterway in the vicinity of Intercoastal City, covering a distance of 22 miles. This project is pending authorization.

Waterways in Mermentau-Calcasieu River Basin

Mermentau River.—The Mermentau River and its tributaries, which include Bayou Nezpique, Bayou Des Cannes, Bayou Plaquemine Brule, and Bayou Queue De Tortue have been improved for navigation, but the project channels are of substandard dimensions when measured by modern-day requirements. Included in the projects for the Mermentau River are structures at Schooner Bayou and Catfish Point to control salt-water intrusion.

Vermilion River.—The Vermilion River provides a channel 8 by 80 feet from Vermilion Bay to the Intracoastal Waterway, and a channel 9 by 100 feet from the Intracoastal Waterway to Lafayette.

Calcasieu River and Pass.—The existing project for the Calcasieu River provides for a deepwater channel 35 by 250 feet from the Gulf of Mexico to the port of Lake Charles covering a total distance of 101 miles.

Lake Charles deepwater channel.—A portion of the Gulf Intracoastal Waterway from the Sabine River to the Calcasieu River coincides with the Lake Charles deepwater channel. This project is authorized to provide for a channel 30 by 125 feet over a distance of 25 miles.

Sabine River

The Sabine River, which borders Louisiana on the west, has been developed to provide for 70 feet of deepwater and 10 miles of shallow-draft channel from the Gulf of Mexico to Orange, Tex. The project from the mouth of the Sabine River to Orange, Tex., provides a channel 30 by 200 feet for a distance of 12 miles.

Red River and Overton Waterway

The Red River flows through Louisiana from a point about 60 miles north of Shreveport to its mouth at the head of the Atchafalaya River for a distance of 370 river miles. The existing project for the Overton-Red River Waterway, authorizes a channel 9 feet deep by 100 feet wide, extending 31 miles from the Mississippi River via Old and Red Rivers, and then by a new land cut along the right bank of the Red River to Shreveport, La., for a distance of 205 miles. The total length of this authorized project is 236 miles. Construction has not been initiated on this project.

Ouachita and Black Rivers

The existing project provides a channel 9 feet deep by 100 feet wide from Red River to Camden, Ark. This project lies within Louisiana for a distance of about 120 miles. The total length of the authorized project from Camden, Ark., to the mouth of the Black River is 351 miles. A recent study by the Corps of Engineers indicates requirements for four locks 9 by 56 by 600 feet. The total cost will be $52 million and has a 1.22-to-1 benefit-cost ratio. This was arrived at by the Corps of Engineers prospective tonnage at 935,000 tons annually. Local interests feel that the average tonnage will be between 1,500,000 and 2 million tons annually.

REQUIREMENTS FOR FUTURE NAVIGATION DEVELOPMENTS

Mississippi River

Mississippi River, Baton Rouge to the Gulf of Mexico.—

Immediate requirements:

(1) Expedite the completion of deepening Southwest Pass to 40 feet, over a width of 800 feet, and assure the effective maintenance thereof.

(2) Provide within the limits of the port of New Orleans a minimum depth of 40 feet over a width of 1,500 feet, with the Federal project assuming responsibility for maintenance within 50 feet of wharves and other port facilities (the present project provides for maintenance to within 100 feet).

(3) Provide for modification of the existing project from New Orleans to Baton Rouge to provide for a minimum channel depth of 40 feet. This improvement may be achieved with a minimum expense for construction and maintenance.

(4) Provide for a cutoff across Australia Point between miles 210 and 220 on the Mississippi River approximately 10 miles below Baton Rouge, and create a slack-water harbor area in Manchac Bend for future development of port and other terminal facilities for deep- and shallow-draft vessels. This will result in a saving of 8 miles in sailing distance for all vessels, and will afford an area for future industrial development.

(5) Provide for a comprehensive bank-revetment program along the Mississippi River from Baton Rouge to Head-of-Passes, and provide shore-erosion protection from New Orleans to Head-of-Passes. This is a requirement in which advocates of flood control, as well as navigation, have a great interest. The stabilization of the banks and the protection of the foreshore against erosion must be accomplished to protect the present and future investments in both private and public works along the Mississippi River.

Additional future requirements: Provide for the deepening of the passes and further improvement of the river channel between New Orleans and Baton Rouge to provide for a channel having a minimum depth of 45 feet. This development is required to permit the passage of supertankers and dry-cargo carriers.

Mississippi River: Cairo, Ill., to Baton Rouge, La.—

Immediate requirements:

(1) Provide for construction and maintenance of the authorized 12 by 300 foot channel from Baton Rouge, La., to Cairo, Ill. No improvements are required within Louisiana to achieve the required navigation depths. However, navigation serving the industry and commerce of the State and plying its other

waterways require the improvements in the upper reaches of the Mississippi River for efficiency of operations.

(2) Provide for completion of the Baton Rouge Harbor by construction of an additional 2.5 miles of 12- by 30-foot channel.

Additional future requirements: Provide for the enlargement of the navigation channel to a minimum depth of 18–20 feet over for existing authorized width. This improvement is required to provide more efficient operating conditions for present-day inland tows. In addition, requirements are expected to develop for use of this waterway by a new type of seagoing vessel, designed for the delivery of dry-bulk cargo to the industrial centers of the Mississippi Valley Such vessel will require the minimum depth of 18–20 feet.

Mississippi River-gulf outlet.—

Immediate requirements:

(1) Complete not later than 1967 the authorized channel to full project dimensions of 36 by 500 feet together with all other necessary works. The potential traffic on this waterway by 1970 is 4 million tons, and by 1980 is 10 million tons of general and dry-bulk cargoes.

(2) Initiate and complete by 1970, the additional lock in the vicinity of Violet, La., and connecting channel between the Mississippi River and the Misssisippi River-gulf outlet. The lock should provide a width of 110 feet, a length of 1,200, and a depth of 40 feet. The present inner harbor-navigation canal lock presently is operating at 85 percent of its theoretical capacity and 100 percent of its practical capacity. With the opening of the Missippi River-gulf outlet, additional requirements will be created immediately which cannot be served by existing facilities. In 1958, the lock passed 13,117,000 tons of traffic, including 7,068,648 tons of Intracoastal Waterway traffic. Potential total traffic in 1980 is 25 million tons of which a maximum of 15 million may pass through the existing lock if improvements are made. A potential load of 10 million tons of traffic is expected to be carried by the new facility.

Additional future requirements:

(1) Provide for deepening of the Mississippi River-gulf outlet channel to 45 feet and for widening to 750 feet by 1980 to provide for passage of the increased potential traffic and to accommodate vessels of larger size and greater draft.

(2) The construction of suitable flood control works and salt-water barriers, together with the development of fresh-water sources within the areas available for industrial and commercial use are collateral requirements for the full development of the outlet and are to be considered in the scheduling of other water resources developments.

Waterways in Pontchartrain basin

Immediate requirements: Development of plans for hurricane protection of lands bordering Lakes Pontchartrain and Borgne must provide for passage of navigation through existing Chef Menteur and Rigolets channels.

Additional future requirements: The Lake Pontchartrain basin is extensively used by recreational craft of all types and sizes. The trend to population increases, together with the completion of the Mississippi River-gulf outlets, will increase the recreational use of the basin and will increase commercial passage over water routes. New centers of commerce will be created by the Mississippi River-gulf outlet. These factors will necessitate additions to the existing channels in this area. Additional improvements to take care of recreational and commercial waterway traffic in the future is estimated to require development of about 25 miles of 12- by 125-foot channel.

Gulf intracoastal waterway (GIWW)

Immediate requirements: Enlarge the waterway to a suitable width and a depth of 18–20 feet from the Mississippi River to the Calcasieu River. This improvement is needed to accommodate the growth of tonnage and potential increased use of the waterway, and to allow for more efficient operation of vessels and tows. This portion of project covers 266 miles. It carried 33.1 million tons of commerce in 1957 and 31.2 million tons in 1958. The increase in traffic has been 75 percent since 1949. The potential shallow-draft traffic on this waterway by 1980 is 50 million tons.

Additional future requirements:

(1) Requirements of navigation and industry will dictate the deepening and widening of the Gulf Intracoastal Waterway to provide a deepwater channel, 35

by 300 feet, from the Calcasieu River to the Atchafalaya River with entrances being provided from the Gulf of Mexico through the existing Calcasieu River and the proposed lower Atchafalaya River deep-draft channels. The length of waterway to be so improved is 145 miles.

(2) Subsequent developments will require extensions of the deepwater channel along the present Intracoastal Waterway to the Houma navigation canal, and finally to the proposed improved Barataria Bay Waterway.

(3) Construction of the proposed deepwater channel will require the provision of suitable salt-water barriers at existing control structures (Calcasieu Lock, Vermilion Lock, Catfish Point control structure and Schooner Bayou control structure) and at other points where intrusion of salt water may occur. With such barriers, the deepwater navigation channel will serve as a reservoir and a channel for preservation and distribution of surface and ground water needed for agriculture and industry.

Waterways from Mississippi River to Atchafalaya River

Immediate requirements:

(1) Provide for early completion of the authorized Barataria Bay Waterway from the Gulf of Mexico to the Intracoastal Waterway to provide for a 12- by 125-foot channel.

(2) Complete construction of Bayou Segnette Waterway to authorized project channel dimensions of 9 by 60 feet.

(3) Initiate and complete improvement of Bayou Lafourche Waterway to provide for a 12- by 125-foot channel from the Gulf of Mexico to the Intracoastal Waterway. Initiate and complete improvements to provide for a 12- by 125-foot channel from Bayou Lafourche to Grand Isle, and extend 12- by 125-foot channel improvements from Grand Isle to the jump at mile 10 on the Mississippi River.

(4) Adopt as a Federal project the Houma navigation canal, being constructed by the State from the Gulf of Mexico to the Intracoastal Waterway, and provide for the maintenance of the channel at dimensions of 16 by 150 feet.

(5) Provide for completion of the authorized project on Bayou Lafourche and provide additional improvements to develop a 12- by 125-foot channel from the Intracoastal Waterway to Napoleonville, La.

Additional future requirements: Develop the Barataria Bay and Bayou Segnette Waterways from the Gulf of Mexico to the Mississippi River in the vicinity of Westwego, La., to provide for a deepwater channel 35 by 300 feet. Such development will be required to supplement other waterways for deep-draft navigation in the vicinity of New Orleans and will afford additional areas for port and industrial development.

Atchafalaya Basin waterways

Immediate requirements:

(1) Develop and maintain to full authorized project dimensions the 20- by 200-foot channel in the lower Atchafalaya River and Atchafalaya Bay from Morgan City to the Gulf of Mexico, as an interim measure pending more extensive improvements.

(2) Complete on an expedited basis the authorized project features of the Morgan City to Port Allen alternate route of the Intracoastal Waterway, including the 12- by 125-foot channel from Indian Village to Port Allen and lock at Port Allen.

(3) Enlarge the Atchafalaya River for navigation to provide for a channel with a suitable width and a depth of 18–20 feet from Morgan City to the Mississippi River via Old River.

Additional future requirements:

(1) Adopt a project to provide for a deepwater channel, 35 by 300 feet, via the most feasible route from the Gulf of Mexico to Morgan City, to include the construction of such protective works as will assure the economical maintenance of the improved channel across or skirting Atchafalaya Bay. These improvements probably will require and should provide the means to prevent salt-water intrusion of existing fresh-water sources. Such salt-water barriers as may be required should be constructed so as not to interfere with or delay passage of the waterways by navigation.

(2) Provide in the long-range plan for enlargement of the Morgan City to Port Allen route of the Intracoastal Waterway to afford a channel, 35 by 300 feet, permitting access by deep-draft navigation via lower Atchafalaya River to the rapidly growing industrial complex between Plaquemine and Port Allen

on the West Bank of the Mississippi River. The development of such a deep-draft waterway will enable the development of slack-water port facilities as well as waterfront sites for industry.

Waterways in Teche-Vermilion Basin

Immediate requirements:

(1) Provide for construction of the proposed Fresh Water Bayou Waterway from the Gulf of Mexico to the Intracoastal Waterway to afford a minimum channel of 12 by 125 feet. Improvements probably will require and should provide barriers to salt-water intrusion of existing fresh-water sources. However, such barriers should not interfere with or delay passage of navigation.

(2) Provide for completion of the authorized project for navigation on Bayou Teche to and above New Iberia, La.

Additional future requirements:

(1) Improve the Fresh Water Bayou Waterway and the Vermilion River to provide for a channel with a depth of 18–20 feet from the Gulf of Mexico to Lafayette, La.

(2) Provide for development of a waterway connection from the Intracoastal Waterway to New Iberia, La., probably via Bayou Petit Anse to afford a 12- by 125-foot channel.

(3) Future developments for navigation in this area can be achieved without detrimental effects on flood control or fresh-water sources. However, suitable protective works will be required to protect against hurricane-induced tides and salt-water intrusion. Such protective works should not interfere with or delay passage of navigation.

Waterways in Mermentau-Calcasieu River Basin

Immediate requirements: (1) Provide for enlargement of the present Calcasieu River and Pass to a minimum depth of 40 feet over a bottom width of 400 feet, and extend this project channel upstream a distance of about 2.5 miles.

Additional future requirements:

(1) Provide for construction of a deep-draft branch to the east of the navigation channel, and south of Lake Charles to provide additional waterfront sites for industry and to serve as a link in the proposed Louisiana Intracoastal Seaway. Barriers will be required to prevent the intrusion of salt water and to preserve surface- and ground-water sources for agriculture and industry. Such barriers should be provided so as not to interfere with the use of this waterway by navigation.

(2) Provide for enlargement of the Mermentau River and Bayou Nezpique to afford a 12- by 125-foot channel from the Intracoastal Waterway to Jennings La.

Waterways in Red River Basin

Immediate requirements: Provide for a suitable navigation channel from the Mississippi River to Shreveport either by construction of the Overton Waterway or by improvements of the Red River for navigation in conjunction with flood control, drainage, and bank-stabilization improvements. A minimum channel of 9 by 100 feet at low water is required initially.

Additional future requirements:

(1) Provide for extension of the navigation channel of the Red River from Shreveport to Texarkana, Tex.-Ark., and to Daingerfield, Tex., via existing natural and other developed waterways, a distance of about 185 miles.

(2) Provide for enlargement of the Red River Waterway for navigation to provide for a 12- by 125-foot channel. Ultimately, the navigation channel to Shreveport should be developed to afford a depth of 18–20 feet.

Ouachita-Black Rivers

Immediate requirements: Provide for the early completion of the authorized 9- by 100-foot channel from Red River to Camden, Ark., and, additionally, provide for the construction of four locks 9 by 56 by 600 feet.

Additional future requirements: Undertake the enlargement of the Ouachita-Black River Waterway to provide for a 12- by 125-foot channel to Camden, Ark.[1]

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[1] Submitted with this brief are maps showing projects in Louisiana by U.S. Army Engineers and inland waterways of the United States by the Corps of Engineers and placed in the committee files.

RELATIONSHIP OF NAVIGATION DEVELOPMENTS TO OTHER WATER USES AND TRANSPORTATION MEDIA

The waterways on which the commerce of our State and Nation now travels provides not only an essential and growing means of transportation, but also provides drainage canals for the rehabilitation of land, and provides reservoirs of storage and channels for movement of water needed by agriculture, industry, and municipalities. The works for navigation and flood control are closely linked in the Mississippi Valley. Navigation is a nonconsumptive user of water resources. Vessles travel over or through the waterways without detriment to the quality or quantity of water. The requirements of navigation often may be met without additional construction costs, such improvements being the byproduct of more extensive developments for flood control, water supply, and/or conservation. Improvements for navigation are a most important feature of most multipurpose water-development projects.

The development of our waterways for navigation is compatible with and beneficial to the development of other transportation media. The development of our Nation's waterways has resulted in industrial growth which requires the services of and simulates the development of our railroads, pipelines, highways, and airlines. Most importantly, our waterways have served our maritime industry in competing with other nations of the world, and have permitted an important inland waterway transportation industry to develop which has no equal.

Our National, State, and local leaders are concerned today about the unfavorable balance of trade with foreign nations. They detect a decline in our exports by virtue of the higher costs of production, which places us in an unfavorable competitive position with other industrial nations of the world. The high cost of labor, lower productivity, rising cost of land transportation have contributed to the unfavorable trend in export trade. Transportation by waterways results in lower cost for bulk and heavy products than is possible by any other transportation medium. Wherever we can bring to or from our major ports the products of foreign trade by waterway transportation, the more likely we are to maintain a favorable balance of trade by offsetting other cost factors. This is particularly important in consideration of the fact that a greater and greater volume of raw materials are to be imported and used by our factories, and that our waterways will permit the transportation to inland industrial centers of the bulk materials at lowest possible cost.

Considering the future requirements for water development for navigation, we must consider the future technological developments of the water transportation vessels, from the viewpoint of both oceangoing and inland navigation. A trend in vessel development leads to larger and faster means of transportation. The replacement program of the Maritime Commission anticipates vessels of greater width, deeper draft, greater length, and faster speed. The development of the barge industry indicates the use of towing vessels of greater power, capable of moving tows composed of many barges. Towboats moving on the Mississippi River today are capable of pushing as many as 40 barges at one time. Again, the economy of our transportation system dictates the savings in time and the larger cargo-carrying capacity which may be obtained only by these new, larger, and more efficient vessels of transportation.

Waterway development must be consistent with these trends in vessel development, both as to dimensions and capacity. The future will dictate harbors and waterways of greater depths and capacities. Major ports and harbors should be afforded with channel depths of 45 feet. Other ports for deep-draft navigation should have channels of a minimum depth of 35 feet. Primary waterways for inland navigation should provide a minimum depth of 18–20 feet. Feeder waterways should have a minimum depth of 12–14 feet.

DISCUSSION OF FUTURE REQUIREMENTS

The Mississippi River presently provides, or soon will provide, a depth of 40 feet from its mouth to the port of New Orleans; however, between New Orleans and Baton Rouge is a growing industrial complex which dictates immediately the deepening of the channel to Baton Rouge to 40 feet. Such deepening can be provided with minimum cost for both construction and for maintenance. This requirement is under consideration by the Corps of Engineers at the present time. The future need will arise for deeping the Mississippi River and the Mississippi River-gulf outlet to a depth of 45 feet to be consistent with the developments in navigation. The port of Lake Charles and of the Calcasieu

River now require deepening to 40 feet minimum. This is actively under consideration by the Corps of Engineers.

On the Mississippi River from Baton Rouge to Cairo, Ill., a depth of 20 feet is indicated as a future requirement. The present authorized depth is 12 feet; however, this depth has not been achieved throughout this entire length. This future requirements is dictated in part by the potential use of vessels which will enable the movement inland of large quantities of bulk and raw materials without the necessity of interchange from maritime to existing inland navigation. Serious consideration is being given to such vessels having capability of both traversing the sealanes and being able to traverse the upper reaches of the Mississippi River system. Such a vessel will not be practicable unless a depth of about 20 feet is provided. The Atchafalaya River also should be improved in the future to provide a minimum depth of 18–20 feet as a primary inland waterway.

Such developments as outlined heretofore are needed to provide adequate deepwater channels to the fort of Lake Charles and to the ports of New Orleans and Baton Rouge. In addition, an adequate deepwater channel should be developed to the fort of Morgan City.

At a later time the need is expected to arise for developing as a deep-draft channel the Barataria and Bayou Segnette Waterways with an additional connection to the Mississippi River. In the future, the need is expected to arise for development of the Morgan City-Port Allen alternate route of intracoastal waterways as a deepwater route to afford access from Morgan City to the industrial complex in the Baton Rouge area.

You will hear from another spokesman of the State regarding the development of the Gulf Intracoastal Waterway as an industrial seaway by which oceangoing vessels may reach the coastal areas along which extensive industrial development is anticipated. This channel should be developed to a depth first of 20 feet, and subsequently of 35 feet on a selective basis as the requirements therefor are manifest.

In addition to the requirements for development of the Mississippi River above Baton Rouge and the Atchafalaya River as waterways with a depth of 18–20 feet, the requirement may be anticipated for developing the Bayou Lafourche Waterway and the fresh-water bayou and Vermilion River to a similar depth. The Red River, from its intersection with the Atchafalaya River to Shreveport, should be developed ultimately to a depth of 18–20 feet. The Black and Ouachita River system should be deepened ultimately to 12 feet.

PROBLEMS WITHIN SCOPE OF NATIONAL POLICY

In considering water resources policies for the future, certain general problems are submitted hereinbelow for consideration and study by the committee. These pertain primarily to developments for navigation and are submitted in the interest of facilitating such developments; however, the same or similar problems may pertain to other water resources activities, or such problems may involve navigation, with other collateral water uses. It is believed that these problems require solution by legislative or administrative policy.

The Chief of Engineers has expressed his concern with the fact that reservoir sites are being preempted for other uses. In a similar fashion the banks of streams and suitable canal sites are being developed to the exclusion of future developments for navigation.

Some means should be found whereby the rights-of-way for additional future developments may be reserved. A case in point is the proposed enlargement of the Gulf Intracoastal Waterway, for which additional rights-of-way will be required. It is recommended that policies be adopted whereby the alinement and extent of developments may be projected into the future to permit the obtaining, or reserving, of the rights-of-way against future requirements by appropriate local interests or the Federal agency responsible for construction.

Attending the problem of acquiring rights-of-way for waterway developments is a related problem of financing by local interests of a growing portion of the costs. Local participation usually involves the acquisition of rights-of-way, for which expenditures are steadily increasing. The financial base on which local funds are to be made available often is the anticipated revenues from waterway improvements. Limited local sources are not capable of supporting projected future developments. To meet the requirements of a long-range program, it is recommended that consideration be given to the means whereby local interests may borrow over a long term, and at a favorable interest rate, the

funds needed for local participation in projects planned or developed for future needs. Such provision may be similar to that of the Water Act of 1958, which permits development of water-storage facilities against future needs. This proposal is not made to relieve local interests of a fair share of costs.

Future developments for navigation require the definition of national policy concerning bridge clearances. Local agencies have been injected into controversies regarding the clearances of highway bridges over navigable waters. The increased volume of both land and water traffic requires that a complete separation of the two be provided at crossings of the major waterways. It is recommended that the Federal agencies involved in this problem be required by the Congress to adopt criteria for bridge clearances which will be consistent with the requirements of waterway development and will not generate a local conflict of interests.

An additional problem involves the standards of economic justification for waterway development. Each Federal agency has adopted an independent set of standards. As a matter of national policy, a common set of standards should be adopted by which all water resource requirements can be measured by whatever agency is responsible therefor.

Senator ELLENDER. Who is the next witness, Mr. Wimberly?

Mr. WIMBERLY. Mr. Chairman, if you permit me, we have one of the other witnesses heretofore referred to, and we would like to interrupt the hearing on navigation to call Mr. L. L. Lovell, president of the Louisiana Farm Bureau Federation, under agriculture.

The CHAIRMAN. Before you do, could I ask the colonel the present navigable depth of the Mississippi up to Baton Rouge?

Colonel LEWIS. Yes, sir. That has an authorized depth of 40 feet to New Orleans, and from Baton Rouge to New Orleans is 35 feet.

The CHAIRMAN. What is the present actual depth? Is that the present actual depth?

Colonel LEWIS. The actual depth in many places greatly exceeds that.

The CHAIRMAN. I see.

Colonel LEWIS. Those are controlling depths to which I refer, and the depths that are maintained over sandbars or other shallow places in the river.

The CHAIRMAN. Thank you.

Senator ELLENDER. All right, Mr. Lovell. Step up, please.

STATEMENT OF L. L. LOVELL, PRESIDENT, LOUISIANA FARM BUREAU FEDERATION

Mr. LOVELL. Mr. Chairman, I appreciate this opportunity to be heard out of my scheduled time. In viewing of the shortness of time, I will not read my statement. I will file it with the committee and summarize very briefly the major points.

Let me say in the beginning that I represent the 25,000 farm families of the Louisiana Farm Bureau Federation.

We are in agreement that there is a very definite need to have a national water policy. However, we recognize that the policy that would be applicable to Louisiana would not be applicable to South Dakota. The policies that would be applicable to the Western States would not be applicable to the industrial East. That raises in our mind a danger of establishing a water policy without a very thorough preliminary investigation of the problems involved, and we are indeed happy to see the Senate take the action that they did in establishing this committee for these hearings, and the Louisiana Legisla-

ture at the last session established for the State of Louisiana a water users' congress composed of all representatives of users of water; that is, agriculture, sportsmen, industrial users, cities, navigation, and all the major water users are represented on this congress established by the legislature to study the problem and report back to the legislature in 1960 as to what they would recommend as a long-range policy for water use in the State of Louisiana.

This has been done, as you know, in a number of other States. We would recommend that the Congress attempt to have this done in each State and then have a National Water Congress before enacting any permanent legislation to establish a national water policy. If this is not done we feel there is a danger of establishing legislation which would not be sufficiently flexible to allow each State to best utilize or best establish a water policy for its own self. If such a National Water Congress were held so that the recommendations for each section were before the congress, then the congress could resolve any sectional differences and at the same time establish a water policy sufficiently broad to allow each State to work out its own problems within the framework of Federal legislation.

I thank you, Mr. Chairman, and this summarizes very briefly the content of the statement that I filed.

Senator ELLENDER. Thank you, Mr. Lovell.

(The statement follows:)

STATEMENT BY L. L. LOVELL, PRESIDENT, LOUISIANA FARM BUREAU FEDERATION, INC.

Gentlemen, I am L. L. Lovell, president of the Louisiana Farm Bureau Federation, and a sugarcane and cotton farmer from Cheneyville, La. The 25,000 farm families who voluntarily pay dues each year to have their interests represented through the 61 parish Farm Bureau organizations in this State have expressed an abiding interest in the preservation of water resources adequate for the needs of agriculture in Louisiana. This interest has been outlined in the policies adopted by Farm Bureau at both the State and National level, and we wish to thank the Select Committee on National Water Resources for providing us an opportunity to present our members' views.

The honorable Members of the U.S. Senate and the members of this committee in particular are to be commended on their foresight in starting now to gather data on available water resources and projected water needs for the next two decades. Such action can result in avoidance of what could become a critical national problem by 1980, affecting farmers perhaps even more than other elements of the population.

We notice that Senate Resolution 48, which established the Select Committee on National Water Resources, stated that it would be the committee's first function to study exhaustively "the extent to which water resources activities in the United States are related to the national interest." There is no question that the preservation of water resources adequate for all is in the national interest. There can be considerable variation, however, in the procedures needed to preserve water resources in the varying geographical areas of the country. We feel sure that it is the intent of Senate Resolution 48 and these hearings to develop these differences in the needs of these various geographical areas.

In this respect, I would like to quote a portion of the water policy of Farm Bureau:

"We favor the maximum participation of individuals, local agencies, and local governments in the development of water projects. Federal participation in water-development projects should be in cooperation with State and local interests. We are opposed to Federal domination of water resource development.

"We favor legislation to require Federal agencies to comply with State laws relating to the use of water, and to respect private rights to use water established by State authority. The right to use water is a property right which should not

be taken from any person without due process of law and adequate compensation."

A copy of all Farm Bureau policies pertinent to this issue is attached to this written testimony, and we respectfully request that they be made a part of the record of this hearing.

In line with our policies calling for more State and local control of water resources, we would point out to the honorable members of this committee that Farm Bureau in Louisiana was instrumental in obtaining legislative authorization for establishment of a special statewide commission to study water needs and problems in Louisiana, and to report its findings and recommendations to the 1960 session of the legislature. This commission has been activated by the Governor and is composed of representatives of the agricultural, manufacturing, forestry, wildlife, petrochemical, and conservation interest of the State, as well as representatives of the State, parish, and municipal governments.

I feel sure that the testimony presented here today will serve to emphasize that Louisiana has many water resources problems. We are rapidly making the transition from a predominantly agricultural State to a heavily industrialized one. As farmers, we are concerned with problems of flood control in many areas, with salt-water intrusion into traditional fresh-water supplies in others, and with the issue of industrial pollution all over Louisiana. Most of our water problems are peculiar to Louisiana, however, and Federal legislation which might suit the arid States of the Southwest or the highly industrialized areas of the Northeast would not be applicable here.

We believe that there is an urgent need to spell out immediately a State water policy for Louisiana. This policy, we presume, would be based on projected population trends, water use, and the like, and would be of such a highly technical nature that we could not even presume to make an accurate estimate at this time. Direction and correlation of this study would be the proper function of the Water Resources Study Commission of Louisiana, which represents a cross section of the water users of the State.

We feel that a careful and extensive study, under the direction of the water resources study commission, could project the industrial, agricultural, recreational, and population needs of Louisiana. The commission would present these findings and recommendations to the legislature for use as the basis of a water resources development program in the State which would have the full understanding and support of all water user segments of Louisiana. It is conceivable that any or all States could spell out adequate policies for water resources development through similar studies. Many State governments lack adequate water policies at the present time, and a number have just recently undertaken exhaustive studies of the type we envision for Louisiana through this commission.

It is our belief that, if Congress were to consider any action at all in behalf of a long-range water resources development program, the first step should be to request State governments to make a careful study of the needs of all water users in their State, and the water resources now available to them, with such studies to be completed within a specified time limit. On completion of such studies, consideration then could be given to the establishment of a National Water Resources Congress which was made up of the various State water control authorities, which could make recommendations to the U.S. Congress concerning water resources and needs.

Such an approach to the water resource problem would insure understanding among all water user segments of the Nation as to the overlapping needs of each segment, and could provide the U.S. Congress with recommendations which were acceptable to all water users. I'm sure you agree that such recommendations would be more satisfactory than present legislative approaches wherein the Congress is forced to decide which of the various pressure groups have the most valid arguments.

We further recognize that, in the development of a constructive program to get maximum utilization of our abundant water resources, it is mandatory that we establish a system of priority needs on the local, State, and National level, with this priority system to be followed in any subsequent development programs. Establishment of this priority could also be a function of the National Water Resources Congress, which perhaps could appoint subcommittees on agriculture, industry, recreation, and the like to establish priorities within the water-use groups. The group as a whole could then establish an overall priority system for the national or multistate projects recommended by the various user groups.

Such a Water Resources Congress, made up of top-level men from each State, appears to us a necessity before sound Federal legislation can be written. This

broad base of knowledge and interests is needed to guide Congress in mapping procedures which would permit each State to write legislation to solve its specific needs, and at the same time provide a basis for any Federal statutes needed to reconcile differences among the States.

We respeitfully submit these recommendations for the consideration of this committee.

WATER POLICY

We favor the maximum participation of individuals, local agencies, and local governments in the development of water projects. Federal participation in water-development projects should be in cooperation with State and local interests. We are opposed to Federal domination of water resource development.

We favor legislation to require Federal agencies (1) to comply with State laws relating to the use of water and (2) to respect private rights to use water established by State authority. The right to use water is a property right which should not be taken from any person without due process of law and adequate compensation.

Substantial progress has been made by some States toward the enactment of adequate State water policy legislation. We strongly recommend that all State farm bureaus continue to study the water problems of their areas, in cooperation with other groups, and develop adequate legislation for the clarification of rights to use water. The creation of a State water resource agency to further the conservation, development, and beneficial use of the water resources of the State is recommended.

We favor action to minimize water pollution, with emphasis on the primary responsibility of State governments and interstate cooperation through interstate compacts. We oppose Federal grants-in-aid for the construction of municipal waste-treatment plants.

Project planning should be on an integrated, multiple-purpose, watershed basis. This may be accomplished by the creation of Federal-State river commissions with responsibility for planning. The States should designate a majority of the members of any such commission. The action of Congress in authorizing a Federal-State study commission for the State of Texas should be considered by State farm bureaus with respect to possible application in their areas. We are opposed to the establishment of additional Federal river basin authorities, including the current proposal for the creation of the Columbia River Development Corporation.

We favor the general principle that revenues from related projects in a watershed basin should be paid into a "basin account" to further maximum development of land and water resources in the watershed. This procedure should not be abused by the inclusion of uneconomic projects.

Irrigation projects selected for development should be those with agricultural and economic feasibility determined by the appropriate land-grant college and the U.S. Department of Agriculture.

All irrigation project plans should include an appraisal of the probable drainage needs of the land and an estimate of the costs of necessary drainage.

Prior to the construction of an irrigation project, provision should be made to assure that the irrigation district assumes responsibility for the repayment obligations and for administration of the irrigation project.

Local or State governments, or instrumentalities thereof, or agencies created by interstate compacts should be permitted and encouraged to assume operating responsibilities and ownership of proposed or existing Federal projects, or portions thereof, upon the assumption of repayment obligations. Such transfer should be made only on a basis acceptable to the people served.

Groups of citizens, local and State governments, and political subdivisions thereof, and agencies created by interstate compacts should receive payment from Federal funds for flood control, navigation, and other nonreimbursable benefits in the same manner as Federal projects.

The productive capacity of American agriculture has outrun effective market demand, resulting in surplus production and depressed prices. We therefore recommend that irrigation phases of Federal multipurpose reclamation projects which would bring new land into production be postponed until needed. We recognize that supplemental water supplies are needed to stabilize agriculture in many areas.

We favor the use of reasonable acreage limitations on Federal irrigation projects involving the development of new lands. Such limitations should emphasize high productivity per farm family rather than placement of the maxi-

mum number of families. Acreage limitations should be eliminated on projects supplying supplemental water where the lands are largely, or entirely, privately owned and farmed and have existing water rights.

IMPLEMENTING WATER POLICY

We believe a comprehensive revision of Federal legislation relating to water resource development is necessary to establish a more effective approach to the most efficient use of our water resources.

This legislation should authorize the creation of a Federal-State river commission for any basin or basins to undertake a coordinated and continuing study of the development of water resources.

We further recommend the creation of an independent advisory agency to Congress to analyze economic and technical data and present its recommendations to Congress with respect to Federal participation in water-development projects and programs. This agency should be established so as to assure impartial and objective analysis of proposals. The analysis should include (1) the economic feasibility of any project, (2) whether the project represents an efficient use of the resource consistent with the long-range interests of all concerned, (3) the amounts to be allocated for nonreimbursable purposes, (4) the reimbursement to be expected from each class of persons benefited by the project and how this reimbursement should be made, (5) the priority of the project in relation to other projects, and (6) the allocation of responsibility for construction and operation of the project.

LOUISIANA FARM BUREAU FEDERATION RECOMMENDATIONS

Water policy

All laws governing stream pollution should be enforced, particularly in view of increasing pollution by refuse from industry. Investigation is needed on the detrimental residual effects of stream pollution on irrigated land, livestock, fish, and wildlife in general.

We recommend more research on replenishing our underground water supply, and on making more economical use of our surface water. Such research should be designed toward eventually getting some type of water conservation program through State legislation.

Farmers should be allowed to use already existing stock ponds, built with governmental assistance, for irrigation purposes, provided that the supply of water is maintained at a satisfactory level.

We urge that engineers of the department of public works and all commissions, committees, or boards make public as soon as practicable the results of their studies and research.

Toledo Bend project

We endorse the proposal for the Toledo Bend project in Sabine and De Soto Parishes with the following qualifications: Farmers and other residents of the reservoir area must be justly and sufficiently paid for their relocation, and every effort should be made to assure State and local government control of the project.

Irrigation, drainage, and flood control

We request the Governor to activate the water rights study commission.

We endorse the coordination of the department of public works and the U.S. Engineers in developing a plan to control salt-water intrusion from the Gulf of Mexico into streams used in irrigation to southwest Louisiana. We urge that, in the implementation of a program of fresh-water supply for irrigation purposes, these agencies coordinate efforts to assure that drainage networks be maintained, and heavy overflow from reservoirs be adequately provided against.

We recommend a system of low-level dams in the Boeuf River for the purpose of increasing available irrigation water, water for fish and wildlife, and the supply for raising the water table. We favor a system of dams, canals, and floodgates on Cane River and Little River in Natchitoches Parish.

There is need for continued and expanded research on the problems of irrigation. We recommend that proper steps be taken to encourage and assist Louisiana State University in the expansion of this research.

The Ouachita River affords a water supply usable for irrigation purposes to farmers in Ouachita Valley, but this water supply depends on locks in that

river maintained by the U.S. Government. We request that these locks be continued in operation and maintenance by the U.S. Government, not only to facilitate transportation, but also for impounding water for irrigation. It is likewise necessary to insure an adequate supply of fresh water in the Ouachita River for the use of industry and for recreational facilities.

We recommend that the Louisiana Farm Bureau Federation request the department of conservation, division of wildlife and fisheries, to carry out a thorough investigation of the present pollution of the Ouachita River along its entire length within Louisiana and ask that appropriate remedial action be taken to correct and prevent pollution.

New lands and irrigation

We are opposed to the Federal Government opening up new lands and irrigation projects for agricultural production while lands or acreage are taken out of production due to the present acreage-control program.

Senator ELLENDER. Proceed, Mr. Wimberly.

Mr. WIMBERLY. Now, Mr. Chairman, with your permission, I would like to recall Col. William H. Lewis.

Colonel LEWIS. Is Mr. Schutts present?

Mr. SCHUTTS. Yes, sir.

Colonel LEWIS. I would like to present to the committee Mr. Elmer Schutts, engineer of the port of Lake Charles.

Senator ELLENDER. All right, Mr. Schutts. You may proceed.

STATEMENT OF ELMER SCHUTTS, ENGINEER OF THE PORT OF LAKE CHARLES

Mr. SCHUTTS. Senator Kerr, Senator Hart, Senator Ellender, gentlemen, before proceeding with my talk I would like to introduce Mr. Mordelo L. Vincent, representing the Lake Charles Association of Commerce, and also Mr. Rudolph Cross, who have yielded to me for 5 minutes that they have on the program in order that I may more adequately present the statement of the Port of Lake Charles Authority.

Mr. Vincent and Mr. Cross.

Senator ELLENDER. All right, sir. Proceed.

Mr. SCHUTTS. Gentlemen, it is a strange thing that the State of Louisiana, which has the greatest rainfall of any State in the Union, the greatest surface-water supply, and the greatest underground storage in the aquifers of the State, is in certain portions of the State about to run out of water, fresh water.

It would seem that the conservation and utilization of waters in the State of Louisiana might not be compatible with navigation interests. On the other hand, we in the southwestern part of the State are dependent upon fresh water and the use of fresh water for our great $1 million industrial development in that area and that, in turn, is dependent upon the navigation on the Lake Charles, Ouachita, and pass ship channel, so that the two things link themselves together in a very close relationship.

The CHAIRMAN. Pardon me. Congressman McSween just came in, I believe. We would be very glad to have you come up here and sit with us, Congressman.

Mr. SCHUTTS. To the Honorable Senate Select Committee on National Water Resources Development, Alexandria, La., presented by the Board of Commissioners, Lake Charles Harbor and Terminal District:

I. HISTORY OF IMPROVEMENTS

The port of Lake Charles was officially made a port of entry by act of Congress in the year 1879. From then on until 1921 various improvements in the pass, consisting of construction of jetties, dredging of approach channel across the bar, and providing a shallow channel through Calcasieu Lake were made by the Federal Government and private interests. In 1921 a concerted effort was made by Lake Charles and Calcasieu Parish to open Calcasieu River for deep-sea navigation. A $3 million bond issue was voted by the parish of Calcasieu, organized as a navigation district, and the port was opened to deep-sea-draft ships in November, 1926. The route of this channel, however, followed the river only to near the south line of Calcasieu Parish, and thence turned west to the Sabine just below Orange. This channel was taken over for maintenance in the year 1928 by the U.S. Government.

In 1934 the interests in Lake Charles, the dock board and the association of commerce deepwater committee, petitioned the U.S. Engineer for favorable action on the direct channel going out Calcasieu Pass. This project was approved by Congress in 1937 and completed in the year 1941, just before the outbreak of World War II.

During the war period, this channel was improved from 30- to 35-foot depth to accommodate T–2 tankers, serving the Navy and our farflung battlelines. In 1956 the use of economical supertankers began to increase for the handling of petroleum and petroleum products. Petitions were presented to the Corps of Engineers to increase the dimensions of this channel from 250 by 35 feet to 400 by 40 feet, this being considered the minimum dimension for the proper handling and passage of supertankers. The petition of the Lake Charles Harbor and Terminal District was reported on unfavorably by the Board of Engineers and designated as lacking in justification on the 1956 petition and report. The Board of Commissioners of the Lake Charles Harbor and Terminal District immediately requested a reconsideration of this project and asked for a hearing before the Board in Washington. This hearing was held on July 21 of this year.

II. PRESENT TONNAGE

The tonnage from the port of Lake Charles has increased steadily from 200,000 tons in 1928 to an estimated figure of 20 million tons during the present year. The investment in industrial plants along this channel has risen until today it has reached $1 billion.

In the first 6 months of this year, the use of supertankers from various refineries, chemical plants, and petroleum handlers along this channel increased 300 percent, until today supertankers are delaying supertankers, as well as dry-cargo liners. These delays are penalizing the port and, if not rectified, will impair the industrial development of southwest Louisiana.

The port of Lake Charles is of great importance to the entire rice area of southwest Louisiana, as well as Arkansas. There is a definite necessity to keep the improvement of all the gulf-coast ports in depth and width of channel abreast of the constantly increasing dimensions of modern ships.

Today, supertankers move cargo at approximately one-third less cost than the T–2 tankers used during the war period. Any petroleum port in which they cannot be used will be penalized, and additional refining capacity will not be located where proper depth and width for safe navigation is not available.

III. RELATIONSHIP OF WATERWAY DEVELOPMENT FOR NAVIGATION TO OTHER WATER USES AND OTHER TRANSPORTATION MEDIA

The relationship between the Lake Charles Calcasieu River and pass ship channel and the Intracoastal Waterway is a very close union. To begin with, the original Lake Charles-Calcasieu Parish deep water utilized the right-of-way of the Lake Charles-Sabine Intracoastal which had been donated to the Federal Government. On this right-of-way the original channel to the Sabine River was constructed 30 by 125 feet. This relieved the Government of any maintenance dredging on the Intracoastal Canal for over 30 years.

The intracoastal canal has been used for the transportation of oil and other material to the port of Lake Charles for refining and exportation by tanker and dry-cargo ships. The importance of the intracoastal canal itself cannot be overemphasized from a national defense standpoint as well as an economical means of transportation for thousands of commodities transported by barge over its waterways along the southern coast of the United States.

The relationship of inland navigation to highways, railways, and pipelines is a very close and complementary one. For example, a large quantity of the rice is exported by the port of Lake Charles, and it moves into the port by truck. This applies to many other commodities. Because of the port of Lake Charles and the industries grouped along the ship channel, the railroad carloadings here have been reported by railroadmen as the heaviest of any city of 70,000 population.

IV. REQUIREMENTS OF FUTURE DEVELOPMENTS FOR NAVIGATION

The requirements for bridges and other structures which do now or may in the future constitute a conflict between land and water transportation should, in the opinion of the port, be given more careful consideration. The policy of the Federal Bureau of Public Roads in designing a bridge structure to accommodate traffic for 50 years has adopted a criteria of providing bridge clearances only for channels in being; this, even if immediate improvements to larger channel dimensions are being given serious consideration.

This, it would appear to us, is a shortsighted policy, which may work a hardship on the development of water transportation. The criteria for establishment of water transportation or developing any waterway is, in many cases, hard to meet. On new channels where waterway traffic has not been established, and on existing waterways where the economic benefits to navigation have been well established, a 1-to-1 ratio between benefits and costs is required for justification of the expenditure of Federal funds. Determination of benefits for this criteria seems to be a little too flexible.

With reference to requirements of local participation or non-Federal costs on the waterway projects, it is suggested that more thought

and study be given to the installation of bridges, submarine pipeline crossings, and other structures before Federal permits are granted for their construction. The furnishing of right-of-way for waterway projects is an old-established requirement and is, we think, amply fair. We see little logic, however, in requiring taxpayers to put up as non-Federal participation large amounts of money to lower oil company pipelines and to change bridge structures approved by and installed under the jurisdiction of the Federal Government. Many worthwhile channels have been blocked by such lack of study, and some method should be worked out to carry this expense as part of Federal costs.

Gentlemen, we believe that the jurisdiction over bridge clearances, both vertical and horizontal, should remain in the hands of the U.S. Engineers, who are cognizant of the problems of navigation, and none of that authority should be delegated or assigned to the Federal Bureau of Public Roads.

I would like to read just one paragraph from a publication here. It says:

> The advent of the supertanker and its appearance on the Lake Charles ship channel made it apparent to the Board of Commissioners of the Lake Charles Harbor Terminal District that dimensions of the direct channel to the gulf were obsolescent and inadequate to handle such vessels. The use of supertankers is a must with any large refinery on tidewater handling petroleum and petroleum products. These vessels range in width from 90 to 120 feet and in draft from 34 to 48 feet. The economy achieved in transportation, cutting the cost to approximately two-thirds, is such a great advantage that it cannot be overlooked, nor can refineries unable to use them compete with those who can.

I thank you very much, gentlemen. Are there any questions?

Senator ELLENDER. Thank you, Mr. Schutts.

Who is next?

Colonel LEWIS. Dr. Hamilton, representing the Louisiana Intracoastal Seaway Association.

STATEMENT OF DR. HERBERT A. HAMILTON, LOUISIANA INTRACOASTAL SEAWAY ASSOCIATION

Mr. HAMILTON. Distinguished gentlemen of the U.S. Senate Select Committee on National Water Resources, please accept our appreciation of your interest in water development and for the privilege of appearing before your committee.

I am Herbert A. Hamilton, president of the Intracoastal Seaway Association and professor at Southwest Louisiana Institute at Lafayette, La.

Gentlemen, my colleagues and I are here to represent the Louisiana Intracoastal Seaway Association, Inc. Our association is a quasi-public, nonprofit organization chartered in 1958. The activities of our organization are governed by a board of directors composed solely of individuals appointed by the eight police juries (board of county commissioners) who are members of the organization. The purpose of our organization is set forth in article II of the charter (app. A).

In compliance with Senate Resolution 20, 1954 Louisiana State Legislature, a study entitled "The Feasibility of a Water Supply and Deepwater Industrial Channel Connecting the Calcasieu and Atachafalaya Rivers, La.," a preliminary survey was completed by

the Louisiana State Department of Public Works (app. B). This study recommended the construction of a channel having a depth of 34 feet and a bottom width of 300 feet along the present route of the Gulf Intracoastal Waterway from the Calcasieu River to the Atchafalaya River, continuing to Houma. Since the completion of this feasibility study, our organization has endorsed extensions, provided they are feasible, to the Sabine River on the west and Bayou Lafourche on the east.

This brief is being presented in the section on navigation for the convenience of the committee. However, it should be emphasized that the project which we advocate embodies provisions for the development in south Louisiana of all types of water resources—fresh-water supplies for agriculture, industry, municipalities, wildlife and fish, recreation, and navigation. The benefits of the broad water-development project will accrue directly to all sectors of our economy, national as well as local.

The purpose of your committee is to evaluate our present and potential water requirements and, in the light of these requirements, to recommend the means by which our overall water requirements can be economically and efficiently met. The men who conceived the idea of a deepwater channel along the Louisiana gulf coast had in mind the same far-reaching objectives established for your committee; they wished to solve water problems which presently exist and provide adequate water resources for our future development. We realize that the committee is not here to consider specific projects, and the presentation of this project should not be misconstrued as a request for its endorsement by the committee. We do, however, feel that this project provides for the maximum usage and development of water resources in south Louisiana and embodies the broad concepts of water development that are of interest to the committee.

Despite the fact that Louisiana is blessed with a surface- and ground-water supply that is probably greater than any other State in the Union, there are at present deficiencies and problems of water supply. With increases of population, industrialization, and irrigation, the situation will become more critical. There is enough water within the State of Louisiana to meet all water requirements for generations to come, but this water is very unevenly distributed. While billions of gallons of water flow unused to the Gulf of Mexico through the Mississippi and Atchafalaya Rivers, areas only a few miles away are confronted with shortages of water.

The proposed Louisiana Seaway embodies two broad functions: (1) the distribution of a portion of the surplus water of the Atchafalaya River to areas of south Louisiana where it is presently needed and in the future will be needed for development, and (2) the development of a channel navigable by most oceangoing merchant ships. It should be emphasized that the second function is dependent upon the first, as will be pointed out momentarily.

The minimum flow of the Atchafalaya River is exceeded in the United States only by that of the Mississippi River, from which the Atchafalaya derives part of its flow. The lowest flow on record for the Atchafalaya is 17,400 cubic feet per second, and the average flow is 170,000 cubic feet per second. By broadening and deepening the present Intracoastal Waterway and constructing a series of control

structures and reservoirs, a portion of the fresh water from the Atchafalaya can be economically distributed in south Louisiana to points as far west as the Texas-Louisiana line.

According to studies by the Louisiana Department of Public Works, there was a surface-water deficiency of 472,000 acre-feet in 1953, and by 1980 the deficiency will increase to 704,600 acre-feet. Rice irrigators use about 90 percent of all water consumed in southwest Louisiana and despite the great quantity of water they use, they sustain losses of about $740,000 annually because of a deficiency of good fresh water and irregular or contaminated streamflow. By 1980 it is estimated that rice production will increase 25 percent. There is also a nationwide trend toward the use of supplementary irrigation during periods of inadequate rainfall.

Another major problem that exists along the gulf coast is salt-water intrusion. Because of flat stream gradients, occasional high tides, and removal of water from streams in excess of their flow, salt water has at times intruded many miles upstream, resulting in contamination of municipal, irrigation, and industrial water supplies. This problem is especially critical in the Calcasieu and Vermilion Rivers. Along the Vermilion, where the ground-water supply is at times recharged from the river, many wells have been contaminated or have been completely abandoned. The seaway would alleviate this situation by providing an adequate supply of water and prevent salt-water intrusion by maintaining streamflow and a system of salt-water barriers.

Industrial development along the gulf coast has proceeded at a more rapid rate than for the Nation. Virtually all industries need water, but the types of industries that have located in this area, and will probably in the future locate here, require quantities of fresh water that stagger the imagination. They have been attracted to this area because of the raw materials and water supplies that are available. By 1980 it is estimated that the industrial water requirements in southwest Louisiana will be 270 percent greater than they are today. Water requirements will be this much greater if the water is available. If industries have no assurance of an adequate water supply, they will locate elsewhere. To desire local industrial development is admittedly selfish; however, it is to the advantage of the entire United States to encourage the development of industries in an area where their products can be produced most efficiently and economically.

Although it is not precisely known what the effect of introducing greater quantities of fresh water into the coastal areas will have upon wildlife and fish, the results will assuredly be beneficial. Large areas of marsh will be restored to their original fresh-water condition, streams will be less contaminated, and conditions in bays where oysters and shrimp breed will be improved.

The second major function of the proposed seaway is to provide industrial sites accessible to oceangoing cargo ships. The importance of access to ocean transportation to industries along the gulf coast is evidenced by the fact that 85 percent of the industries receiving tax exemptions in Louisiana from 1956 to 1958 located on channels with depths of 34 or more feet. Also, one need only to look at Houston, Lake Charles, Corpus Christi, or any other area along the gulf coast

with a deepwater channel to see the significance of water transportation in their industrial development. Suitable industrial sites accessible to deepwater transportation are no longer readily available in many areas. When the availability of sites accessible to deepwater transportation is viewed in conjunction with areas having adequate water supplies for industry, the number of sites available becomes still smaller. It is estimated that this proposed seaway will make available 80,000 acres of industrial sites having access to both deepwater navigation and an adequate water supply.

Five conditions make it imperative that adequate industrial sites be provided along the gulf coast. This area has a population which is increasing at a more rapid rate than the Nation's, and new industries will be required locally to supply their needs. With an increasing reliance upon the importation of raw materials from foreign countries, more port-oriented industries will be established to process these raw materials. There is an economic advantage in processing many of the raw materials obtained along the gulf coast at their source rather than transporting them to other areas for processing. The petroleum and petrochemical industries, which predominate in the area, are interrelated in such a way that the products or byproducts of one are the raw materials for another. These industries have their optimum locations adjacent to each other in areas with adequate water supplies and transportation facilities. National defense requirements make the decentralization of industry imperative. No U.S. coastal area can be defended as easily as the gulf coast.

Preliminary feasibility studies have already been made. Further studies have been unanimously authorized by the Louisiana Legislature, and arrangements are being made for these studies by the department of public works. The initial estimates of the cost of the project are $337,800,000 for initial construction, with annual charges of $11,598,000. No detailed cost-benefit studies have as yet been made, but the study already completed concludes that the proposed seaway will result in $3.7 billion in new industries employing 92,500 new workers and an increased personal income of $600 million annually.

The establishment of the Select Committee on National Water Resources Development is evidence of the realization of a need for an overall water policy to systematically develop our water resources so that our Nation will derive the maximum benefit. With this same objective in mind, we have presented the proposed Louisiana Intracoastal Seaway project to the committee and hope that the information will be of some benefit to you.

Some other sources of information concerning water problems in south Louisiana are as follows:

1. "The Louisiana Intracoastal Seaway," by Dr. Conrad Joyner and Vernon Behrhorst, published by the Louisiana Intracoastal Seaway Association.

2. "The Feasibility of a Water Supply and Deepwater Industrial Channel Connecting the Calcasieu and Atchafalaya Rivers, La.," published by the State of Louisiana, Department of Public Works.

3. "Report and Recommendations, Southwest Louisiana Water Supply Problems," published by the State of Louisiana, Department of Public Works.

Gentlemen, I will be happy to answer any questions that you might wish, or try to answer the questions.

Senator ELLENDER. Thank you, Dr. Hamilton.

Are there any questions?

As I recall, there was some study going on by engineers that were hired by the people who propose this. Is that study going on?

Mr. HAMILTON. We are developing studies at the present time, sir.

Senator ELLENDER. I presume as you develop them you will be able to furnish them to the committee?

Mr. HAMILTON. Yes, sir; we will do so, sir.

Senator ELENDER. Thank you very much.

Senator ELLENDER. All right, Mr. Wimberly.

Colonel LEWIS. I would like to present next Mr. Karl Loeb, waterways chairman, Morgan City-Berwick Chamber of Commerce.

Senator ELLENDER. All right. Mr. Loeb, you may proceed, sir.

STATEMENT OF KARL E. LOEB, WATERWAYS CHAIRMAN, MORGAN CITY-BERWICK CHAMBER OF COMMERCE

Mr. LOEB. Mr. Chairman, Senator Ellender, Senator Hart, it is a privilege for particularly a local interest to be allowed to attend this hearing.

My name is Karl E. Loeb. I represent the city of Morgan City, the Morgan City Chamber of Commerce.

I would like to have Mr. Miller orient us on the navigation canal. There are approximately 250 miles between the mouth of the Mississippi River and the Calcasieu River. Midway between this area is located the Atchafalaya River, the mouth of the Atchafalaya. It is approximately 29 miles from the port to the Gulf of Mexico. The port of Morgan City is located 65 miles from Port Allen in Baton Rouge.

The subject of our testimony is navigation interests in the Morgan City-Berwick area.

The Louisiana gulf coast between the mouth of the Mississippi River and the Calcasieu ship channel is approximately 250 miles in length. The port of Morgan City offers the only deepwater harbor between the New Orleans and Lake Charles outlets. This portion of the Louisiana coast does not have a single harbor channel capable of affording entrance by boats and barges of drafts adequate for use in the Gulf of Mexico.

Closely spaced port channels are important because of frequent hurricanes in the gulf. Due to long distances between ports during the last war, the Louisiana coast was frequented by enemy submarines. Destroyers and escort vessels could not be based in this area, and many ships were sunk. In periods of emergency or when the national defense is involved there should be no restrictions to stand in the path of speedy evacuation and rapid movement of heavy equipment and defense supplies. The Morgan City area, due to its geographic location, would well serve as an emergency alternate port to New Orleans. Waterways and emergency routes must be given due consideration and their importance to the Nation cannot be minimized.

The harbor of the port of Morgan City consists of Berwick Bay, which is over 60 feet in depth. Nearby are located Bayou Boeuf,

Bayou Teche, Bayou Shaffer, and the Intracoastal Waterway, offering many miles of frontage for harbor developments. The construction of a channel 20 feet deep and 200 feet wide to deep water in the gulf was authorized by Congress in 1910. Although the Atchafalaya Bay ship channel has been a Government-owned waterway for over 50 years, not more than $5,000 a year average has been spent on maintenance up until the spring of 1958. At Morgan City, the Gulf Intracoastal Waterway is bisected by the Atchafalaya River. Thus, Morgan City provides a major terminal and interchange point for waterway traffic. The alternate route of the Gulf Intracoastal now connects to the Mississippi River at Plaquemine and is now being extended to Port Allen.

The Atchafalaya River affords another important link north from Morgan City to the Mississippi at Old River. The lower Atchafalaya River provides an outlet to the Gulf of Mexico. Because of the shorter distance to the Mississippi River, the northern route up the Atchafalaya saves traffic some 320 miles on round trips between the Southwest and the Ohio Valley.

By reason of the intersection of the Gulf Intracoastal, water traffic flows easily, and in quantity that yearly shows substantial increases. The direction of this traffic is to the north, south, east, and west.

Some of the tonnage figures I will give briefly:

The Gulf Intracoastal Waterway traffic through the Bayou Boeuf locks at Morgan City:

	Tons
June 1957–May 1958	12,597,898

The Atchafalaya River south to the Gulf of Mexico:

	Tons
1945–54 (10-year average)	530,523
1958	2,433,707

An increase on the average of almost 500 percent.

A note to these figures should be kept in mind—official records are based on vessel-operator reports that are turned in to the U.S. Engineers. In the last several years it has been impossible to obtain complete records due to the great increase in the number of vessels using the route and failure to turn in reports. There exists a wide divergence in reported and actual tonnage. In 1957 the Morgan City Harbor and Terminal Commission reported that over 6 million tons actually used the channel.

The Atchafalaya River from the port of Morgan City north to the Mississippi:

	Tons
1945–54 (10-year average)	993,000
1958	4,922,033

An increase of almost 500 percent.

The Plaquemine-Morgan City alternate route to the Mississippi:

	Tons
1946–55 (10-year average)	1,904,225
1958	2,901,212

An increase of some 50 percent.

On completion of the new route to Port Allen, the estimate is that the alternate route will eventually carry some 7 million tons.

The port of Morgan City is a customs port of entry, having recently been declared as such.

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	Tons	Entered	Cleared
July to November 1959	5,388	30	28
July 1958 to June 1959	6,583	42	46

Tonnage handled within the past 5-month period nearly equals the total amount handled within the entire previous year.

There is an immediate and ever-increasing need of the completion of the Atchafalaya Bay ship channel to depths and width proportioned to the needs of the extensive and almost overwhelming amount of tonnage moving in and around the port of Morgan City. There is also an immediate need of widening and deepening the Gulf Intracoastal Waterway to accommodate the traffic moving along the waterway at this time.

The latest development which makes the construction and maintenance of adequate waterways at Morgan City is the oil development in coastal waters. Oil companies have spent millions of dollars in exploration and development. Oil geologists have stated that the gulf area contains the most prolific oil-bearing areas on earth.

Maj. Gen. Charles H. Holle, U.S. Corps of Engineers, in an address entitled "The Long Look Ahead" delivered before the annual meeting of the ICA, had this to say:

> Beyond plans and estimates, beyond any outlines that can be filled in with facts and figures and justifications, there must exist, in the minds of all of us who are concerned with the development of water and navigational resources, a picture of the future, necessarily vague as to detail but doing adequate justice to the energy and aspirations of our regions, our people, and our Nation; that this picture shall constitute our goal; and that, as such, it will cease to become visionary and will exert its own compelling force in our affairs.

Gentlemen, that is the test of our oral testimony. We have submitted to you a written brief.

Thank you very much, gentlemen.

Senator ELLENDER. Are there any questions?

Thank you, Mr. Loeb.

(The prepared statement referred to follows:)

STATEMENT BY KARL E. LOEB, CHAIRMAN, MORGAN CITY-BERWICK CHAMBER OF COMMERCE

ATCHAFALAYA BAY SHIP CHANNEL TO THE GULF OF MEXICO—SOUTHERN ROUTE

The Louisiana gulf coast between the mouth of the Mississippi River and the Calcasieu ship channel is approximately 250 miles in length. The port of Morgan City offers the only deepwater harbor between the New Orleans and Lake Charles outlets. In view of the existing 16-foot channel at the mouth of the Atchafalaya River, this portion of the Louisiana coast does not have a single harbor channel capable of entrance by boats and barges of drafts adequate for service in the Gulf of Mexico. This fact is particularly noticeable in that the coastal areas to the east and west of this section are plentifully supplied with port channels, all of which were constructed and are maintained by the Federal Government.

Closely spaced port channels are important because of frequent hurricanes in the Gulf of Mexico. During the last war, the Louisiana coast was frequented by enemy submarines due to long distances between ports. Destroyers and escort vessels could not be based in this area, and many ships were sunk.

Morgan City, La., is practically in the geographic center of the Louisiana coastline. It has a fine harbor, consisting of Berwick Bay, which is over 60 feet in depth, and Bayou Boeuf, which is more than 20 feet in depth. Bayou Teche,

Bayou Shaffer, and the Intracoastal Waterway offer many miles of frontage for harbor developments. It is served by a main-line transcontinental railway, and by a coast-to-coast paved highway, at the point where these facilities pass closer to the gulf than at any other point in the entire 250 miles of unimproved coastline. The port of Morgan City is served also by the 12- by 125-foot Gulf Intracoastal Waterway, which branches at Morgan City. Both branches join the Mississippi system of inland waterways, one at New Orleans, the other at Baton Rouge, La. The Intra-coastal Waterway to the west joins Morgan City with the western gulf ports by means of an inland channel adequate for barge transportation.

The lower Atchafalaya River affords a broad, natural channel of sufficient width and depth to accommodate the needs of modern ocean vessels for 17 miles below the city, where it enters Atchafalaya Bay. That bay is a shallow body of water with a shifting bottom.

The Corps of Engineers of the U.S. Army recognized the advantages of the port of Morgan City as a location for a seaport many years ago. The construction of a channel through the bay 20 feet deep and 200 feet wide to deep water in the gulf was authorized by Congress in 1910.

The Atchafalaya Bay ship channel has been a Government-owned waterway for over 49 years. Throughout the life of the channel not more than $5,000 a year average has been spent for maintenance. Due to density of traffic and drafts of vessels using the waterway the requirement would seem to be of not less than project dimensions. In fact a 35-foot depth should be recommended as a projection of present-day needs. Prior to the expenditure of $350,000 in 1948, losses of $2 million were annually suffered by users.

ATCHAFALAYA BAY SHIP CHANNEL TO THE GULF

The Atchafalaya River is equally important to the north of Morgan City, where it provides an important link to the Mississippi River. In 1956, the Atchafalaya River from Morgan City to the Mississippi at Old River carried 3,695,000 tons, as compared to a 10-year average of only 993,000 tons. In 1958 the tonnage increased to 4,922,033 tons. Speaking of the extensive use being made of the Atchafalaya River as a connecting link between Morgan City and the Mississippi River, a spokesman of the Corps of Engineers stated that the cost of improving and maintaining this route (1956, $87,000; 1957, $110,000) has represented an extremely small investment for the benefits obtained. The importance of this area is evidenced by the Federal Government's two enormous projects that on completion will have tremendous impact on shipping, that of the Old River closure and lock to the Mississippi and the Morgan City-Port Allen alternate route. On completion of the alternate route, shippers will be provided with a 12-foot waterway from Morgan City to Baton Rouge which is 160 miles shorter than the present route through the Harvey lock and up the Mississippi.

Col. William Lewis, while district engineer of the New Orleans district, made this statement:

"At Morgan City, La., a number of waterways join to provide a major terminal and interchange point for waterway traffic. The alternate route of the Gulf Intracoastal Waterway now connects to the Mississippi River at Plaquemine and is now being extended to Port Allen where an additional lock is under construction. The Atchafalaya River affords another important link north from Morgan City to the Mississippi at Old River. The lower Atchafalaya River provides an outlet to the Gulf of Mexico. Because of the shorter distance to the Mississippi River, the northern route up the Atchafalaya saves traffic some 320 miles on round trips between the Southwest and the Ohio Valley."

INLAND WATERWAY SYSTEM LINK

In addition to the port of Morgan City being a key point for traffic flowing south to the Gulf of Mexico and north to the Mississippi River, it is also the point of the intersection of the Intracoastal Waterway and the Atchafalaya River. This is a vital link in the inland waterway system which extends from Brownsville, Tex., to Florida. Maj. Gen. E. C. Itschner, Chief of Army Engineers, before the Intracoastal Canal Association at the annual convention in Houston in 1957, made this comparison of waterway traffic. He stated that 22 million tons during the year 1956 were being carried by the Ohio River, and 25 million tons over a considerable length of the lower Mississippi. The Gulf

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Intracoastal Waterway had 18 million tons of traffic in its busiest year, so it was close to the top two in total amount. On the Ohio it was necessary and economical to construct locks 110 feet in width and 1,200 feet in length to accommodate traffic and, in addition, the channels of both the Ohio and the Mississippi are very wide, affording ample passing room. General Itschner had this to say, "It is amazing to me to see how 30 million tons of traffic can be accommodated on the Gulf Intracoastal Waterway with a minimum channel width of 125 feet at the bottom and locks 56 or 75 feet in width and 425 to 1,182 feet in length."

CONSERVATION

A new note has been added to many issues involved in the Atchafalaya Basin, the mouth of the Atchafalaya, and the Gulf Intracoastal Waterway—that of conservation. A recent meeting between the Police Juries of St. Mary and Terrebonne Parishes indicates the need of water conservation. These two bodies at present are undertaking a survey of the entire problem of navigation flood control and water conservation in the Atchafalaya River Basin.

Mr. Roy T. Sessums, vice president of the Freeport Sulphur Co., in a recent address at a water resources conference held under the auspices of the Mississippi Valley Association in June of 1959 had this to say in addressing the conference: "Many ask why we should now be concerned about water resources and their conservation. This would be a logical question, for, when we see the enormous flow into the Gulf of Mexico from the rivers of Louisiana, it is somewhat difficult to imagine any danger of this State running out of water. On the average, each day, more than 500 billion gallons of water from the various streams of Louisiana flow into the gulf. This is more than double the 240 billion gallons of water per day required to meet the needs of the country. However, it has been stated that by 1980 the minimum water needs of the Nation will rise to nearly 600 billion gallons per day. Thus, you can readily see why the lower Mississippi area is a beacon to water-hungry industrial plants."

In a recent survey the U.S. Geological Survey made the following statement regarding water: "The number of areas in which undeveloped supplies of fresh water are available has diminished considerably with the rapid growth of industries and population in the past decade. Many are as previously considered to have unlimited water resources have reached the point at which water shortages either exist or are threatened. Many communities are painfully aware that industrial development is impossible where there is not plentiful supplies of relatively low-cost water."

Mr. Hu B. Myers, chief engineer of the Louisiana Department of Public Works, had this to say in a recent talk on development of water resources in the Mississippi-Louisiana-gulf coast area: "Sometimes we are inclined to think that the growth which we are experiencing will know no bounds or will continue without end, but this is not so. Just as elsewhere, our growth is limited by what we have to offer in the way of location and resources. We can't grow beyond our water resources, but we can realize our full potential and make the most of what we have by exploring every opportunity to further develop our water resources * * * the most valuable asset of the Louisiana-Mississippi-gulf coast area."

LOUISIANA INTRACOASTAL SEAWAY ASSOCIATION

The deepwater industrial channel connecting the Calcasieu and Atchafalaya Rivers is proposed, by the Louisiana Intracoastal Seaway Association, to follow the existing Gulf Intracoastal Waterway. Dredged to a depth of 34 feet on a bottom width of 300 feet, this project would provide deepwater industrial sites and would make a vast seaport out of most of southwest Louisiana. This is the type of project that would have to be developed in stages, working eastward from the Calcasieu while opening up the Atchafalaya ship channel at Morgan City. Including extension to Houma and certain rail and highway facilities, the work is estimated to cost about $250 million. It is estimated that this channel would provide 92,500 new jobs, $600 million annually in new income, and $3.7 billion worth of new industry.

(NOTE.—The deepwater industrial channel is one of some 9 or 10 projects being under survey by the Louisiana Department of Public Works.)

Included in the exhibits accompanying this report is a copy of an illustrated brochure entitled "In South Louisiana Prosperity Flows Where the Water Goes." In it will be found comprehensive and relevant matter pertaining to the complete feasibility, cost, and benefits to be gained from an early completion of

deepwater industrial channel mentioned above. It is urged that this complete brochure be attached to this report. The project is well within the scope of a water resources and development survey.

STATEMENT OF SENATOR RUSSELL B. LONG

In September of 1959 U.S. Senator Russell B. Long, writing in an article published in the Morgan City Review, stated:

"The port of Morgan City has been becoming of increasing importance to the State of Louisiana and to the citizens as a whole for many years. This is particularly true as the Intracoastal Canal, which offers a protected waterway for the oilfields of Texas to the Everglades, has developed to carry an ever increasing load of waterborne traffic. Perhaps no waterway in the entire United States has justified itself as much as the Intracoastal Canal in the vicinity of Morgan City, La."

IMPORTANCE TO NATIONAL DEFENSE

In periods of emergency or when the national defense is involved there should be no restrictions to stand in the path of speedy evacuation and rapid movement of heavy equipment and defense supplies. The Morgan City area, due to its geographic location, would well serve as an emergency alternate port to the port of New Orleans in time of national emergency. Waterways and emergency routes must always be given due consideration, and their importance to the Nation cannot be minimized.

Maj. Gen. Charles G. Holle, of the U.S. Corps of Engineers, in an address entitled "The Long Look Ahead," delivered in 1956 before the annual meeting of the Intracoastal Canal Association, had this to say:

"Beyond plans and estimates, beyond any outlines that can be filled in with facts and figures and justifications, there must exist, in the minds of all of us who are concerned with the development of water and navigational resources, a picture of the future, necessarily vague as to detail, but doing adequate justice to the energy and aspirations of our regions, our people, and our Nation; that this picture shall constitute our goal; and that, as such, it will cease to become visionary and will exert its own compelling force in our affairs."

TONNAGE FACTS

Tonnage records show that, during the 10-year period beginning 1945, the average tonnage of the Atchafalaya Bay ship channel was 530,523 tons. Tonnage recorded by the U.S. Engineers for 1956 show an increase to 1,767,462 tons. As official records are based on vessel-operators' reports received by the Engineers, many vessel operators failed to turn in such a report. In the last several years it has been impossible to obtain full and complete records because of the great increase in the number of vessels using the route. There exists a wide discrepancy between reported and actual tonnage using the channel. The Morgan City Harbor and Terminal report presented to the Mississippi Valley Association in 1957 conservatively estimated the 1957 tonnage reached 6,100,304 tons. The year 1957 was a peak year in which oil activity in the gulf was very intense. Substantial and extensive records were presented to support this figure.

With these totals as listed, and using as a point of origin the intersection of the Atchafalaya Bay ship channel and the Gulf Intracoastal, a movement of over 21 million tons in all directions occurred. There is a substantiated estimate that, due to the offshore oil operators, the 1956 tonnage going south to the gulf was better than 3 million tons in excess of scheduled figures.

Despite the 1956 peak year, tonnage from 21 to 25 million tons passed through, as a point of origin, the port of Morgan City, La. This reflects the tremendous growth of water transportation in this area. The traffic on the entire Gulf Intracoastal Waterway in 1956 exceeded the 10-year average by 10 million tons, with the greatest growth occurring on the Mississippi-Sabine section with an increase of 123 percent. The Atchafalaya River from Morgan City to the Mississippi at Old River in this period exceeded its 10-year average by over 300 percent.

In the establishment of requirements, comparisons must be made of existing tonnage and the growth of that tonnage over specified intervals. This report

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covers, in its attached schedules, a tremendous upsurge in usage and tonnage on waterways discussed.

TONNAGE FIGURES

A schedule of tonnage on waterways intersecting at the port of Morgan City, La.:

Atchafalaya River south to the Gulf of Mexico

	Tons
1945–54 (10-year average)	530,523
1955	1,004,433
1956	1,767,463

The above figures from U.S. Engineers totals derived from operators' reports. 1956 estimated tonnage substantiated in Morgan City-Berwick Harbor and Terminal report presented to the Mississippi Valley Association, February 1957.

1956	6,100,304
1957	2,503,609
1958	2,443,707

Atchafalaya River route north

	Tons
1945–54 (10-year average)	993,000
1956	3,695,000
1957	4,894,370
1958	4,922,033

Plaquemine-Morgan City alternate route

	Tons
1946–55 average	1,904,225
1951–55 average	2,025,712
1956	2,889,651
1957	2,876,060
1958	2,901,212

Commerce transported over Atchafalaya River (Morgan City to the gulf)

Total tons	Year	Foreign		Domestic			
		Imports	Exports	Inbound	Outbound	Local	Through traffic
2,443,707	1958	1,660	8,121	81,887	505,501	5,523	1,841,015
2,503,609	1957	2,345	1,944	52,171	356,034	44,902	2,046,213
1,767,462	1956	2,323	232	501,294	293,967	71,231	898,415
1,004,433	1955	1,646	70	426,904	188,365	68,799	318,649
594,432	1954	917	110	331,530	73,434	37,213	151,228

Source: U.S. Army Corps of Engineers.

Gulf Intracoastal Waterway traffic through the Harvey locks at New Orleans, La.

	Tons
Average 1951–55	13,695,231

Gulf Intracoastal Waterway traffic through Bayou Boeuf locks at Morgan City, La.

June 1957–May 1958	12,597,898

Since July 1, 1959, there has been a great increase in port activity in comparison with the previous year. The tonnage handled within the past 5-month period is nearly equal to the total amount handled within the entire previous year.

Tonnage through U.S. customs station, port of Morgan City, La.

	Tons
July 1959–November 1959	5,388
July 1958–June 1959	6,583

Movement of vessels through U.S. customs station, port of Morgan City, La.

Date	Entered	Cleared
July 1 to Nov. 25, 1959	30	28
July 1, 1958, to June 30, 1959	42	46

CONCLUSION

A summary and conclusion of this report relative to the Port of Morgan City, La., would conclusively point to the immediate and ever-increasing need of the completion of the Atchafalaya Bay ship channel to depths and width proportioned to the needs of the extensive and almost overwhelming amount of tonnage moving in and around the port of Morgan City, key point in a complex system of converging waterways.

The growth of many cities on the gulf coast which have been furnished with harbor channels by the Federal Government during the 50 years since the improvement at Morgan City was first authorized, indicates the utilization which could have been expected had it been found possible to maintain the Morgan City channel. None of these later developments had the natural harbor facilities which are available at Morgan City; nearly all of them were closer to previously existing ports; and few of them had the superior connections with the interior.

The latest development which finally makes the construction and maintenance of an adequate channel to Morgan City mandatory is the oil development in coastal waters. Oil companies have spent millions of dollars in exploration work in Louisiana coastal waters and have located many large oil deposits in the coastal area. Oil geologists have stated that the shelf region in the gulf coast may contain the most prolific oil-bearing areas on earth.

Ten years ago at a public hearing the following statement was submitted by several major oil companies who had begun operations in the gulf:

"The Atchafalaya River with its great, natural inland harbor, Berwick Bay, enters the Gulf of Mexico at almost the exact midpoint of this vast unexplored potential oil-bearing province. In fact, the first proven area lies exactly opposite, and approximately 25 miles beyond the point where it empties into the Atchafalaya Bay. No less than 90 percent of the exploratory work along the Louisiana coast thus far has been conducted from Morgan City and Berwick due to their strategic location. Until recently all drilling and offshore construction activity has been on the Atchafalaya River. Exploration, construction, and drilling operations all have made extensive use of marine equipment, both large and small. Much of the large equipment has had its use limited by the waterway to the gulf."

An accurate rule to follow could be simply stated: "Provisions for the future have to be made now—in order to accommodate the needs of the future."

Senator ELLENDER. I want to give assurances to witnesses who happen to cut their presentations so short to save time that their entire statements will be placed in the record.

All right. Who is next?

Colonel LEWIS. Mr. Chairman, with your permission I would like to supplement that brief by one which I hold here from the Morgan City Harbor and Terminal District of Morgan City, La., and file it for the record.

The CHAIRMAN. It will be filed for the record, then, at this point.

(The brief referred to follows:)

STATEMENT BY A. J. PATTIE, PRESIDENT, MORGAN CITY HARBOR AND TERMINAL DISTRICT

Morgan City and Berwick being situated as we are, midway from the port of New Orleans to the east and Lake Charles to the west, with the Atchafalaya River from the Gulf of Mexico south to the Mississippi River to the north, and the Intracoastal Canal east and west, we are at the crossroads of waterway facilities to help serve the Nation.

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Without a doubt, Morgan City should, and could be, developed into a deep-sea port, second only to New Orleans.

The Atchafalaya Bay ship channel was adopted by the Federal Government in the year 1910, and approval of a channel of 14 feet in depth by 100 feet clear bottom width.

This channel was badly neglected until World War I, when wooden ships were being built in Morgan City for use as freighters. When completed, the channel was found too shallow for the boats to move from this port. The Federal Government had to do emergency dredging to move the boats to their destination.

The port still suffered from no maintenance until World War II when floating drydocks were being built here. The same procedure was followed (emergency dredging of the channel) to be able to move these drydocks for further use to help the cause.

The channel has been neglected since, until the creation of the Morgan City Harbor and Terminal District in 1952, a political subdivision of the State of Louisiana. This body has been very active in the development of the Atchafalaya Bay ship channel.

We were very fortunate in the years of 1957 and 1958 to have the Corps of U.S. Engineers survey and improve the channel to its original dimensions of 14 by 100 feet at a cost of $350,000. The Morgan City Harbor and Terminal District again conferred with our congressional delegation in Washington, D.C., and impressed them with the idea of an annual appropriation for maintenance of the Atchafalaya Bay ship channel. The delegation agreed. The Corps of Engineers this year, 1959, are now doing work on the channel and when completed should be to a depth of 16 feet by 100 feet.

Waterborne commerce through the Atchafalaya Bay ship channel alone has shown a steady increase since the year of 1949 of 436,098 tons to the year of 1957 with 2,503,609 tons of commerce.

The increase was most noticed since 1955 with a tonnage of 1,004,433 tons to the present 2,503,609 tons. We have reason to believe that this could and will increase to greater amounts if we were able to secure a channel of greater dimensions (32 feet in depth by 500 feet in width). We have here a deepwater harbor that could and would provide the proper facilities to accommodate seagoing commerce to all parts of the globe.

In time of war the Atchafalaya Bay ship channel could be utilized in an emergency to the national defense program, as it is the only other natural outlet from the Gulf of Mexico to the Mississippi River and its tributaries (the greatest natural waterway system in the world), with a saving of 135 miles over any other port in the area.

The Louisiana gulf coast between the mouth of the Mississippi River and the Calcasieu ship channel, approximately 300 miles in sailing distance, does not have a single harbor channel capable of entrance by boats and barges of drafts adequate for service in the Gulf of Mexico. This fact is particularly noticeable in view of the fact that coastal areas to the east and west of this section are plentifully supplied with port channels, all of which were constructed and are maintained by the Federal Government.

Closely spaced port channels on the gulf coast are particularly important because of the frequent hurricanes in the gulf. During the last war the Louisiana coast was a good hunting ground for submarines because of the long distance between ports. Destroyers and escort craft could not be based in this area and many ships were sunk which might have been saved.

Morgan City, La., lies practically in the center of this blank coastline. It has a fine natural harbor consisting of Berwick Bay, which is over 60 feet deep, and Bayou Boeuf, more than 20 feet deep. Bayou Teche, Bayou Shaffer, and the Intracoastal Waterway offer many miles of frontage for harbor developments. It is served by a main line transcontinental railway, and by a coast-to-coast paved highway at the point where these facilities pass closer to the gulf than at any other point in the entire reach of unimproved coastline. It is also served by the 12- by 125-foot Gulf Intracoastal Waterway which branches at Morgan City. Both branches join the Mississippi system of inland waterways, one at New Orleans and one at Baton Rouge. These latter cities are great industrial centers. The Intracoastal Waterway to the west joins Morgan City with the western gulf ports by means of an inland channel adequate for modern barge transportation.

The lower Atchafalaya River affords a broad natural channel with a least width of 1,200 feet and depths in excess of the needs of modern ocean vessels for 17 miles below the city where it enters Atchafalaya Bay.

The Corps of Engineers, U.S. Army, recognized the advantages of Morgan City as a location for a seaport many years ago, and was authorized by Congress in 1910.

During both World Wars the Navy has recognized the importance of Morgan City's location and has established some important activities here. These were very small in comparison with what would have been done had an adequate dependable channel been available.

The fact that the banks of Berwick Bay are quite stable and that there is very little rise and fall in water elevation even during flood stages makes wharf construction relatively inexpensive and costs of handling goods from ship to shore are minimized.

Morgan City has rapidly grown as a natural base for all offshore activities in the gulf. The vessels and equipment from the port serve a wide area of the broad Continental Shelf that is being probed for oil and gas. Since 1953, the tempo of offshore activity has increased and the movement of vessels, equipment, and cargo through the ship channel has become more and more hazardous, because of its shallow depth and especially its narrow width.

Hoping the committee will examine this report thoroughly and take action to fulfill our needs and requirements for future development.

Colonel LEWIS. I will call, then, Mr. Vorhoff, president, Abbeville Harbor and Terminal District.

STATEMENT OF J. C. VORHOFF, JR., PRESIDENT, ABBEVILLE HARBOR AND TERMINAL DISTRICT

Mr. VORHOFF. Mr. Chairman, committee members, my name is J. C. Vorhoff, Jr., from Abbeville.

On behalf of the Abbeville Harbor and Terminal District we would like to present a brief on the vital need for the development of the channel from intercoastal cities to the Gulf of Mexico through freshwater bayous.

Marine transportation is conceded to be the most economical form of transportation, and navigation interests are vitally concerned with the ever-increasing need for conservation and equitable distribution of the water supply of Louisiana.

These needs are primarily felt in these three vital areas:

(1) National defense and security;
(2) Offshore oil operations and industries; and
(3) Commercial fisheries and sportsmen.

One of the most pressing reasons for maintenance of an adequate waterflow into Vermilion Parish and southwest Louisiana is the need of our national defense and safety for water-navigation routes. At the present time there is a stretch of some 144 miles along the Gulf Intracoastal Waterway from Morgan City to the Calcasieu River where there is no suitable channel connecting the Intracoastal Waterway and the Gulf of Mexico. With the control of Southwest Pass to Vermilion Bay looming ever nearer in order to create a freshwater reservoir in the Vermilion Bay area, the vital need for a channel from the Intracoastal Waterway to the Gulf of Mexico in the Freshwater Bayou area is increasingly urgent for defense purposes.

During World War II enemy submarines lurked off of our Louisiana coast in the Gulf of Mexico, harassing shipping in the gulf, with a resultant loss of lives and many tons of shipping. There is no reason

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to believe that in the event of a future war, that such a situation could not again exist with even more disastrous results than were felt in World War II. This menace and others just as violent to our national defense can be lessened with adequate water-navigation routes. The use of the submarine today to launch atomic missiles on our inland cities is entirely possible.

The increase of activities in the offshore areas of southwest Louisiana has been tremendous with 190 marine drilling rings operating at the last report. The ratio of success in offshore operations (1 producer for every 2.8 wells drilled) points to the fact that this figure will increase at a rapid rate. Those who are closely connected with the fertile offshore operations speak of it lasting 50 years or more. These 190 marine drilling rigs require various services which are primarily furnished in the most economical way, marine transportation. If the waterways of southwest Louisiana, where the bulk of offshore operations are conducted, are not maintained at proper levels, the future of the tremendous offshore operations, and necessarily the economy of the area will be vitally affected.

Commercial shrimpers and fisheries are also heavy users of the waterways and would be adversely affected if further efforts are not undertaken to maintain a certain and adequate supply of water in our bayous, rivers, lakes, and bays of Vermilion Parish and southwest Louisiana.

Menhaden plants are interested in the vast untapped menhaden fishing grounds in the Gulf of Mexico off of Vermilion Parish, and the primary reason for their failure to locate in Vermilion Parish can be traced to the fact that there is not a safe, short route to the Gulf of Mexico to be found between Lake Charles and Morgan City. With the establishment of these menhaden plants in Vermilion Parish, a great need for an adequate water supply for navigation purposes will be immediately felt.

We are attaching to our brief here studies made by the department of public works at the hearing before the Corps of Engineers in March 1957 and also an economic report that is prepared by the Freshwater Navigation Corp. Reference: Brief submitted by Freshwater Bayou Navigation Corp. to Corps of Engineers at hearing on proposed fresh-water-bayou route, held at Abbeville, La., March 28, 1957.

See also report of Louisiana Department of Public Works submitted to Corps of Engineers at hearing had at Abbeville, La., March 27, 1958.

Along the Louisiana coast in the Vermilion Parish area are to be found some of the Nation's best deep-sea fishing areas, which at this time are virtually unused. These areas remain scarcely touched because of a lack of a safe, landlocked route to the Gulf of Mexico from the Intracoastal Waterway. With such a route available sports fisherman would have easy access to these great deep-sea fishing areas, and would be assured of safe harbor in case of severe weather in the gulf. The availability of such a route would be of tremendous importance in the economy of southwest Louisiana in the Vermilion Parish, La. area.

Gentlemen, I thank you for the opportunity to present this brief.

Senator ELLENDER. Thank you, Mr. Vorhoff.
Any questions?
If not, thank you very much.
(Brief referred to above follows:)

STATEMENT SUBMITTED BY THE FRESHWATER BAYOU NAVIGATION ASSOCIATION, STANLEY PEARSON, PRESIDENT

PREAMBLE

The Louisiana offshore oil development is one of the engineering wonders of the world, and although the scene of action is actually in the open gulf, there is a stretch of some 144 miles along the Gulf Intracoastal Waterway from Morgan City to the Calcasieu River where there is no suitable channel connecting the Gulf Intracoastal Waterway and the Gulf of Mexico.

The offshore oil development has grown so fast and is now so large that those intimately connected with it now speak in terms of 50 years or more.

Although drilling some 60 miles from shore in water over 100 feet deep is already an actuality, the industry is now planning on the obstacles to be encountered in water of considerably greater depth.

Thus, this presentation of economic justification in conjunction with individual supporters who will voice their own opinions is merely an illustration of a few facts which would have to be multiplied many times to obtain a complete picture.

Although completely disassociated from oil production, the menhaden industry has now assumed huge proportions and the proposed channel will create new opportunities in that field, as is shown more in detail herein.

THE MENHADEN INDUSTRY

The following facts were obtained in a conference with an interested menhaden plant operator:

The menhaden industry is of such importance that some preliminary details are desirable.

The menhaden congregate in large numbers in the gulf around the mouths of fresh-water streams, which supply much of its food. The final discharge of the Vermilion River where it enters the gulf through Vermilion Bay is a favorable location and we are informed that around Trinity Shoals off of Vermilion is an excellent menhaden fishing ground that is not producing anything now because of its distance from existing menhaden plants.

The menhaden fishing boats are not usually refrigerated. Since the menhaden is a comparatively cheap fish, the expense of refrigeration has, up to the present time, made its usage unattractive. Thus, the plant must be located within a few hours from the fishing grounds because the catch must be fresh when it reaches the plant. If the catch is not fresh, then the oil that is produced from such fish has a high content of fatty acids and its value is greatly reduced. The meal or scrap from fish that are not fresh is reduced practically to a fertilizer basis instead of being used for chicken feed, hog food, and cat or dog food.

The boats used by an interested party are 110 feet long, 22 feet in width, and require about 10 feet or more of water for proper navigation.

The cost of a menhaden plant is about $600,000. It requires five boats to keep a plant supplied. These boats cost about $150,000 each. This makes a total capital investment of $1,350,000 on which the depreciation-amortization is about 10 percent per year or $135,000 per year due to the fact that the plant and boats are either exposed to or handle fish saturated with salt water.

Out of each million fish, there would be produced—

12 tons of residue from solubles, at $100 per ton	$1,200
70 tons of fish scrap at $120 per ton	8,400
40 tons of oil, at $160 per ton	6,400
Total	16,000

One plant would handle about 100 million fish per year, which would make the total value of the production $1,600,000.

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After deduction of $135,000 for the capital depreciation-amortization, the balance would amount to $1,465,000.

The tonnage produced would amount to 33,000 tons of menhaden moving into the plant. If the plant used water transportation for the outbound products, this would increase the tonnage by 12,200 tons, or a total of 45,200 tons. However, in order to be conservative, we are not claiming any savings on the outbound products.

A conspicuous feature of this situation is that, today, the menhaden in the proposed fishing area are virtually an economic waste and one plant on the proposed channel would create employment for 150 men on 5 boats and 80 men in the plant, a total of 230 men. The entire amount of $1,465,000, which is the money put into circulation over and above the proportion of capital outlay, would be economic gain, because it does not exist today.

One prospective operator says that if he located on the new channel, he would be followed by at least one of his competitors and that the competing situation would be very similar to his and therefore the total economic gain for this industry on the new channel would be the above figures. This would produce the following figures:

Economic gain for 2 plants (2×$1,465,000)	$2,930,000
Tonnage of menhaden	66,000
Potential additional outbound tonnage of products	24,400
Total new employment of men on boats and plants	460

ILLUSTRATIONS IN CONNECTION WITH THE OFFSHORE OIL INDUSTRY

Exhibit No. 1 is an outline from a service company which estimates a saving of $10,000 a month ($120,000 per year). There are about four companies performing similar work and it is reasonable to expect that they would also benefit from substantial savings. To be conservative we believe that $360,000 per year would be a fair estimate of the savings for this type of service companies.

Exhibit No. 2 is a letter from a very large general contractor, that makes an estimate of $11,420 per year savings on only a very small portion of their work. A conservative estimate is that there are over 10 contractors who would make similar or greater savings. An estimate of $114,200 per year savings for that type of industry appears to be fair.

One well-known operator who is operating two rigs in the Louisiana offshore area at this time estimates that the proposed channel would result in savings of $80 to $100 per day per rig, with the anticipation that their drilling will increase in the future. Using only two rigs as an illustration, there would be an average saving of $90 per day per rig. This does not include any savings on the transportation of oil which is being treated separately.

Another large operator has calculated that in the operation of four rigs in the area that the savings would amount to about $1,382 per day—not including oil transportation inbound from the wells.

Using these two concrete illustrations, it is obvious that the savings increase with the number of rigs. We are dealing with an area where operations must be on a colossal scale and all the indications point to large-scale operations. For instance, in an address before the American Petroleum Institute at Shreveport on March 21, 1957, Mr. Henry J. Wallace, vice president, sales, National Tube Division of the United States Steel Corp., revealed the results of their recent studies, which included reference to a 12-billion-barrel oil potential in the gulf tidelands; a forecast that by 1970 there would be 1,300 offshore wells drilled each year in the gulf. He expects to see 600 gulf offshore well completions in the year 1957 and 1,000 well completions per year by the year 1965.

Using past figures as a foundation, a conservative estimate is that some 85 percent of these wells will be in the Louisiana offshore area. It is reported that the Louisiana offshore area comprises about 16,000 square miles within a depth of about 120 feet. We estimate that some 3,600 square miles south of Abbeville, La., is an area where some saving in time, distance, and expense could be effected when compared with the Atchafalaya or Calcasieu route.

The relationship of the fresh-water bayou territory to the entire area is about 22 percent.

Using the figures of Mr. Wallace of 600 offshore well completions for 1957 and 1,000 well completions for 1965, we arrive at an anticipated total of 750 well completions for 1960.

Using the year 1960 as an illustration of a period when we hope the proposed channel will be in full operation, we arrive at the following figures:

Total estimated offshore wells in gulf	750
Total estimated for Louisiana (85 percent)	637
Estimate for fresh-water-bayou area (22 percent of Louisiana)	140

Particular attention is called to the fact that, according to the study of the United States Steel Corp., the well completions per year for 1965 will be approximately double the year 1956.

It can clearly be seen that the offshore industry will need almost double the transportation it had available in the year 1956.

The proposed channel is therefore not a project that would merely shift some business from one locality to another. It would not rob Peter just to pay Paul. The offshore oil industry is still in its infancy and the outlook is that it will need more available channels to keep pace with the rapidly growing anticipated development.

Using the previously explained figure of $1,328 per day savings for four rigs, it produces an average saving of $332 per well per day, and, using the previously explained figure of $90 per day average for two rigs, produces an average saving of $211 per day per well. Competent authorities expect drilling to continue for a period of some 20 years and more.

Using 1960 as a representative year, we have shown that about 140 wells will probably be drilled in the fresh-water-bayou area. The drilling time per well is approximately 30 days. Using the savings of $211 per day per well, we estimate that the total savings would be 140 times 30 times $211, or a total of $886,200 for the year for well drilling alone through the proposed channel.

SAVINGS IN DISTANCES

Using a sheltered area of the Calcasieu River, the Atchafalaya River, and the proposed channel near the shoreline, and computing distances to points in the area where it is considered that savings can be produced via the proposed channel, we find the following distances which can be called the open gulf mileages:

	Close in	Midway	Distant
Atchafalaya	56	65	84
Calcasieu	72	84	108
Fresh-water bayou	8	36	72
Savings in open gulf mileage in fresh-water route under closest other route	48	29	12

NOTE.—Average of the 3 foregoing is 29⅓ miles savings.

In long-distance hauling, a distance of some 30 miles is inconsequential, but in this case we are dealing with very short hauls in a region subject to treacherous weather. Here we have a situation where 30 miles comprises about over one-third of the open gulf mileage.

This does not necessarily mean that a one-third saving in mileage is a one-third saving in the cost. It must be remembered that the time consumed in loading and unloading is the same for an 86-mile trip as for an 800-mile haul. The governing factor is, "What is a suitable differential for a 30-mile saving in a haul that averages about 86 miles?" My opinion is that a reduction of about 20 percent is fair.

On a short haul, distance means time and time means money.

TRANSPORTATION OF OIL PRODUCED IN OFFSHORE REGION

In conferences with offshore oil operators as well as experienced oil transporters by water, we learned that as of today, there is no concrete economical plan for moving crude oil from the distant offshore oil well locations. The costs for barging crude oil from locations some 50 or 60 miles out in the gulf to a terminal near the shore are exceedingly high at this time and this is due to two factors. One is the small quantity per movement involved and the other is the necessity for a powerful tugboat (around 1,000 horsepower) and for a sea-

going barge. It is reported that an 80-mile haul with some 50 or 100 miles in the gulf costs about $1 per barrel today, which is many times the cost for inland water transportation. With a reduction in distance of say 30 miles, there should be a saving of about 20 percent under the 80-mile rate.

Since the only known rate is now high, it will probably come down as the movement increases and as operating economies are discovered; thus, it would be unsound to say that there would be a saving of 20 cents per barrel based on our formula. The saving would not amount to 20 cents per barrel due to any defect in the formula, but because the basic rate is abnormally inflated temporarily.

We do think, however, that a figure of 5 cents per barrel would be a reasonable saving on crude oil via the fresh-water route versus existing routes.

We will endeavor to estimate the oil movement in the following manner:

The United States Steel Corp. study previously referred to estimated the gulf offshore potential as 12 billion barrels. From our study, we used 85 percent for Louisiana offshore, which would result in a figure of 10,200 million barrels. Also, using our previously named figure of 22 percent for the fresh-water-bayou area would result in a figure of 2,244 million barrels for that area.

Competent oil operators tell us that the offshore fields should be producing for the next 60 years. If we average out the potential for that period, it produces a figure of 37,400,000 barrels per year. Reducing it to a daily basis would be about 103,000 barrels per day.

Based on an estimated drilling program of 140 wells per year annually by 1960, with only a small percentage of dry holes, it is not unreasonable to expect to have some 500 producing wells with an allowable of 200 barrels per day producing simultaneously. These estimates seem to confirm each other.

Of course, all of the oil produced in the fresh-water area would not move through the proposed channel. From our study, we would say that the initial production would most probably move entirely by barge. Then, if or when some group of wells produced in suitable quantities, there would be some pipeline movement. When it is considered that the United States Steel Corp. estimates that gulf pipelines may cost around $60 per foot, the oil pipelines will not come too fast and will be located only where the largest volume is available.

Taking everything into consideration, it would seem that an estimate of, say, 15 percent of the oil produced in the fresh-water-bayou area should move by barge through the proposed channel. This would mean about 15,450 barrels per day. At our 5-cent-per-barrel estimate on savings, it would amount to about $723 per day savings or $263,895 per year.

According to our investigation, the preponderance of the Louisiana offshore oil production at present is somewhat close to shore and, where the volume does not justify a pipeline, it is handled in barges.

Ordinarily, the barges would move the oil from a tank close to the offshore well to an existing terminal on shore and, therefore, one important question is, "Since there is no existing terminal for oil on the fresh-water bayou channel now, what justification would there be for the location of oil tanks in the vicinity of the proposed channel?" We will try to answer that question.

In our opinion, the movement of crude oil from wells some 50 miles out from shore is a problem that has not yet been satisfactorily solved. Such a movement requires either small tankships or specially built barges towed by seagoing tugs; an ordinary inland barge is not permitted to go outside of the inland waterway line in the gulf (about 3 miles out).

Certain fundamental economies in transportation are produced when the vessel with the motive power is used for a load in both directions. Today the large workboats, which in reality are small ships with 1,000 horsepower or more, haul the supplies out to the rigs and return light. A seagoing tug towing an oil barge to pick up oil at a producing well would operate with an empty barge to the well and return with a loaded barge, each performing only a one-way haul.

It is our opinion that, through planning and coordination and through the installation of a towing engine on the large workboats, the workboats could operate from a base on the proposed waterway to the wells with the drilling supplies and towing an empty oil barge and return to the same base towing a bargeload of oil. The principal requirement would be that the supply base be equipped with tanks and equipment to handle the oil.

This proposed fresh-water bayou channel would open a new territory for the location of offshore operating bases for outbound supplies and inbound oil.

Up to now, there has been virtually no serious attempt to effect such consolidations in the offshore operation because they have not been necessary; neither

has there been any large-scale attempt in the past to tie in an inbound and an outbound inland water operation from and to the onshore wells. The reason is that our inland waterway transportation is so cheap, relatively, that an attempt to save on the inland water transportation costs by cooperation is almost inconsequential.

But in the offshore situation we are dealing with very expensive equipment, and a more intensive usage of that expensive equipment can probably be made. Furthermore. it will not be very long before the offshore oil begins to move in volume while a large drilling program is in progress.

The proposed channel fits in perfectly with the foregoing because the proposed increase in offshore activity will require additional facilities and, in the establishment of a new facility, it can be designed in advance to serve the dual purpose of inbound oil and outbound supplies.

In outlining the above, we have not overlooked the fact that when a well is producing it is not in need of supplies in the volume required when the well is being drilled; however, with the anticipated increase in drilling which is expected for at least the next 20 years, there should be many opportunities for reducing the light mileage of the workboats by returning with a loaded oil barge back to the shore base for supplies. To the extent that coordinations can be effected, there should be savings averaging about one-third the cost of the transportation of the supplies and about one-third the cost of the towage of the oil barge. The round trip for the workboat performing a two-way operation would require only a slightly longer time than for a one-way load.

Such savings with a two-way load would be in addition to other savings cited via the closed route and, to be conservative, we are not counting them in the estimates of savings.

The question will arise as to why this type of saving would not work anywhere. The answer is that the existing oil terminals are not usually designed for the handling of the oil well materials and supplies and the supply terminals are not usually designed for the handling of inbound crude oil. But, in the case of the proposed channel, there is ample opportunity for designing the offshore terminals for the dual purpose well in advance.

ACCESSORIAL BENEFITS

Today, a vessel drawing about 11 feet of water in the gulf in vicinity of 92°15′ longitude, in the event of a sudden severe squall, would have to "run" to Cameron for shelter. This is a distance of some 65 miles or more, which, based on a speed of 10 miles per hour, would require over 6 hours. The value of a sheltered place in this midgulf section is incalculable in dollars and cents. It could also mean a saving in human lives.

In conference with a large heavy-lift derrick operator, he expressed a hesitancy to allow his equipment to work in this inadequately served section of the gulf due to the potential danger of sudden squalls. This channel would help solve that problem.

PIPELINE TONNAGE

One of the interesting characteristics of the offshore area south of Freshwater Bayou is that in addition to its oil potential it also produces gas in large volumes. Mr. Wallace, in his aforesaid study, estimates the gas potential at 70 trillion cubic feet.

To utilize this gas will require the building of gas pipelines. Pipeline building is a one-time job in that, after it is installed, there is very little tonnage in maintenance. In the laying of the pipelines there is involved the movement of pipe; the preparation of the pipe for laying, such as encasing in concrete, etc., at an onshore base; the movement of the pipe by barge from the preparation base to the wells, as well as the stringing out. In addition, there is the movement of crew boats, etc. This will probably be an important movement for a number of years ahead. It will probably also involve the connecting lines from various wells to the main line as new oil-gas wells are developed.

The United States Steel Corp. estimates that the gulf offshore wells will need 100,000 tons of line pipe per year up to 1965 and 90,000 tons per year from 1966 to 1970, in the offshore fields.

If we use our aforesaid percentages of 85 percent for Louisiana and 22 percent for the Freshwater area, based on an average of 95,000 tons annually, this would amount to 17,765 tons of pipe for pipelines that would move annually through the Freshwater area for a period extending up to 1970 and probably longer.

In laying pipelines in the offshore waters, every ton of pipe needs about 2 tons of concrete or other anchoring materials. Thus, the total for 17,765 tons of pipe would be about 35,530 tons, or a grand total of 53,295 tons of pipe and anchoring materials. In addition to this, there would be involved crews, workboats, and equipment.

In our opinion, the savings on this traffic would not be as great as on the drilling equipment because there would probably be a better control of the movement. If we use a per-ton rate of savings based on about one-half of the savings on well-drilling materials, it should be about $1 per ton. At this figure, the pipeline tonnage savings should be $53,295 per year.

TONNAGE FOR OFFSHORE OIL WELL DRILLING VIA PROPOSED FRESHWATER BAYOU ROUTE

It is estimated that an average offshore well will run about 9,600 feet deep. It is estimated that such a well will require the following to be hauled from ashore to the well site:

	Net tons
Casing and tubing (as estimated by United States Steel Corp.)	240
Drilling mud and additives	1,000
Fresh water	1,800
Cement	100
Miscellaneous	60
Total	3,200

Using the tonnage of 3,200 tons per well (a very conservative figure), we arrive at the tonnage per year by using our estimate of 140 wells for the Freshwater Bayou area for the year 1960, which amounts to a total of 448,000 tons per year, which will increase as forecast by the United States Steel Corp. study. There are no published rates per ton for this class of transportation, and elsewhere we have calculated the anticipated savings on a per-well basis.

OTHER OUTLETS, EXISTING AND PROPOSED

Attention is called to the fact that although there are other outlets proposed which would also serve the offshore area, such as the New Orleans tidewater seaway, the Barataria Waterway, the Houma-Bayou Terrebonne Waterway, the deepening of the Morgan City-Atchafalaya River Waterway. Not one of these would take the place of the Freshwater Bayou channel for the vast area located between the Atchafalaya River and the Calcasieu River.

There is no conflict between those other projects and this proposal. After reviewing the study of the United States Steel Corp., it would appear that the offshore oil development will need all outlets that can be made available.

SUMMARY

We recommend to the Corps of Engineers that they review the address made by Mr. Henry J. Wallace, vice president, sales, National Tube Co., in Shreveport, La., on March 21, 1957, as well as the booklet prepared by the United States Steel Corp. on the future requirements of the offshore oil industry. We hope to be able to supply the Corps of Engineers with these documents. They are very enlightening.

We estimate the tonnage and economic benefits of the proposed channel, annually, as follows:

	Estimated annual tonnage	*Annual economic benefits*
Menhaden industry	[1] 66,000	$2,930,000
Oil field service industry		360,000
Contractors		114,200
Drilling materials and supplies and tonnage for 140 wells per year	448,000	886,200
Crude oil	867,600	263,895
Pipeline tonnage	53,295	53,295
Estimated grand total	1,434,895	4,607,590

[1] With possibility of 24,400 tons additional.

Undoubtedly there is a considerable amount of other tonnage that, due to lack of sufficient time, we have not been able to include. For instance, in addition to the tonnage covered herein, there is the tonnage of the huge platforms and other equipment. Some of these now require the Mississippi River, and although it is probably that at least a portion will use the proposed channel we are not counting any savings on that potential movement.

It should also be added that some of the drilling mud used offshore moves on workboats hired by the oil companies. A large amount moves via transportation furnished by the suppliers of the drilling mud. Thus far we have been unable to obtain specific figures. It is expected that the drilling mud suppliers will be represented at the hearing with more details; however, it is apparent that there are some additional savings which are not covered by our estimates.

The fresh-water-bayou navigation project has considerable merit; it is economically justified, and the Corps of Engineers is urged to complete its study with all possible speed.

EXHIBIT No. 1

SCHLUMBERGER WELL SURVEYING CORP.,
Houston, Tex., March 7, 1957.

Mr. RENE A. STIEGLER,
New Orleans, La.

DEAR MR. STIEGLER: We read your letter on the fresh-water-bayou project with great interest. If this canal were to be made, actually several of our present problems would be over and solved.

There is little doubt but what we would have a base at Abbeville now if such an outlet existed. Three or four of our offshore operating crews and two of our maintenance boats would be based there.

It is difficult to estimate what the savings in money would be to us. It certainly would save us a large amount of inconvenience which we are now experiencing.

In February it was necessary to send crews from Cameron to Intracoastal City some 10 or 12 times. This cost us approximately $1,200 to $1,500 in actual money. The intangibles involved cannot be evaluated.

Operating our maintenance boats out of the more central Intracoastal City location would save us considerable money in travel expenses. Considering both the actual savings in the decreased traveling and in the decreased traveltime pay, another $1,200 or $1,500 would easily be realized. Once again, the intangible value of easier operation must also be considered.

All of the preceding is based upon operating under the present circumstances. If such a channel as is proposed existed, many more oil companies would operate out of Intracoastal City. Our traveltime to many locations would be appreciably decreased. I feel certain that such a facility would save a conservatively estimated $10,000 a month.

Please accept our apologies for not being able to give you more concrete figures, but, because of the nature of our work, this is difficult to do. Let us know if we can be of further service to you.

Sincerely yours,

F. H. YEARGERS, *Division Manager.*

EXHIBIT No. 2

J. RAY MCDERMOTT & CO., INC.,
Harvey, La., March 18, 1957.

Re Fresh-water-bayou navigation canal.

Mr. RENE A. STIEGLER,
New Orleans, La.

DEAR SIR: We have reviewed the request contained in your letter of February 27, 1957, and wish to make the following comments:

Because of the size of the construction equipment and cargo barges we use in work in the Gulf of Mexico, we would be unable to use this channel so far as the equipment is concerned. We would be able to use this channel for transporting personnel back and forth to the worksite.

The following estimated savings have been calculated on the assumption that we will have five structures to install in this area during a 12-month period.

Each of these installations would require approximately 15 days to complete. We change crews on the equipment every 5 days.

On the above basis and at our present cost and pay scales, we estimate that we would realize a savings of approximately $11,420 per year.

As explained to you in our telephone conversation, Wednesday, March 13, 1957, we have no way of knowing how much work we would have in this area in any 1 year. This would be determined entirely by the various oil companies holding leases in the area.

We trust the above is as requested. Should you desire further information, please call on us.

Very truly yours,

W. J. BENTON, *Engineer.*

Comparison of crew-change cost, Cameron, La., versus Intracoastal City

	Man-hours
Land traveltime, Houma, La., to Cameron (6 hrs.)	276
Water traveltime, Cameron to worksite (5 hrs.)	230
Boat operations (5 hrs.)	5
Total	511
Round trip	2
Total	1,022
Cost per trip	$1,713
Trips per year	20
Total annual cost	34,260
	Man-hours
Land traveltime, Houma to Intracoastal City (4 hrs.)	184
Water traveltime to Intracoastal City (3 hrs.)	138
Boat operation (3 hrs.)	3
Total	325
Round trip	2
Total	650
Cost per trip	$1,142
Trips per year	20
Total annual cost	22,840
Cost per year via Cameron route	34,260
Cost per year via fresh-water route	22,840
Indicated annual savings	11,420

On request, we will furnish other substantiating correspondence since it is impossible to present it all in this brief.

Senator ELLENDER. At this time I think it appropriate to place in the record the following statement concerning the proposed navigation improvements at Freshwater Bayou.

(The statement follows:)

A BRIEF STATEMENT SUPPORTING PROPOSED NAVIGATION IMPROVEMENTS, FRESHWATER BAYOU AND VICINITY, LOUISIANA, BY THE LOUISIANA DEPARTMENT OF PUBLIC WORKS, LORRIS M. WIMBERLY, DIRECTOR

This statement is presented on behalf of the State of Louisiana by the Louisiana Department of Public Works. It expresses the views of the State government on the need for an adequate navigation channel connecting the Gulf Intracoastal Waterway and the Vermilion River with the Gulf of Mexico in the

vicinity of Freshwater Bayou, La. The department has long recognized the inadequacy of the existing route across the shallow depths of Vermilion Bay. In cooperation with the Freshwater Bayou Navigation Association, the department in 1950 proposed and recommended to the Corps of Engineers construction of a new land channel along Freshwater Bayou as the most practical means of improving navigation facilities into the gulf off the central Louisiana coast. Since that time the requirements and volume of commerce have increased, and great economic loss is being sustained by all of south Louisiana because of difficulties attending navigation in this area.

The department of public works urges that prompt action be taken to correct this situation and recommends to the Corps of Engineers construction of a connecting navigation channel between the gulf and the Gulf Intracoastal and Vermilion River Waterways in the vicinity of Freshwater Bayou, La.

Interests depending upon the proposed improvement are the oil and gas industries operating in the tidelands and on the Outer Continental Shelf in the Gulf of Mexico, the menhaden and shrimping industries, and most of the coastal communities between Houma and Lake Charles, La.

In support of the proposed navigation improvements the department submits the following facts:

1. DIFFICULTIES ATTENDING NAVIGATION

The existing route across Vermilion Bay provides the only connecting link with the gulf on the 146-mile reach of the Intracoastal Waterway between the Atchafalaya and Calcasieu Rivers. Controlling depths in Vermilion Bay are about 5 feet, and often as low as 3 to 4 feet off the bar on the gulfward end of Southwest Pass. Most of the fishing vessels, tugs, and marine equipment operating offshore in this area have drafts ranging from 5 to 11 feet. Consequently, many of the larger vessels are forced to use remote bases and travel longer distances to job sites, while the smaller vessels almost continually drag bottom in crossing the bar and bay, or experience frequent delays waiting for favorable tides. In rough weather and storms long distances must be traveled in the open sea to reach a harbor of refuge because of the greater risk involved in navigating the existing route.

2. LOSSES ATTRIBUTABLE TO NAVIGATING EXISTING ROUTE

In attempting to evaluate annual damages to all watercraft caused by deficiencies in the existing route, the department canvassed all shipyards and marine repair establishments in the immediate area. The total cost for repairs to underwater damages only due to inadequate depths was estimated by these firms at $150,000 for each of the years 1955 and 1956. About 500 vessels are repaired annually for damaged bottoms and propellers, and damages to engines resulting from circulation of mud through the cooling system. Most of these boats are owned by individual fishermen and others who transport crews to the oil rigs drilling in the Gulf of Mexico.

3. LOSSES RESULTING FROM NAVIGATING CIRCUITOUS ROUTES

Most of these losses are sustained by those engaged in developing and producing the oil and gas fields in the tidelands and on the outer Continental Shelf. The size of vessels and marine equipment required for this work makes it absolutely impossible to utilize the shorter existing route because of the shallow depths. As a result, most of the operators in this area are forced to transport crews, equipment, and supplies longer distances to reach work sites. Transportation losses of this nature are increasing with the continued development of offshore oil and gas fields.

As of January 1, 1957, there were 19 rigs drilling in the gulf south of Freshwater Bayou. Information from various phases of the oil industry indicate the following annual losses due to navigating circuitous routes:

Oil well surveying	$160,000
Drilling, 80 wells per year	540,000
Platform construction	137,000
Total	837,000

Marine equipment employed in these operations is heavier and larger than required for similar inside work, due to the size and type of construction, and because such equipment must meet requirements for navigating the open sea. Rental costs are high, ranging up to $12,000 per day, consequently delays due to transportation problems are very expensive. These problems are particularly costly when adverse weather or a hurricane is imminent, because no nearby harbor of refuge is available.

4. MENHADEN INDUSTRY

Menhaden account for a large part of all commercial fish taken in the United States. These valuable fish are present in large quantities off the central Louisiana coast, but remain an economic waste because there is no way of reaching the fishing grounds. The proposed canal would provide access to these fish, and would result in the establishment of plants for processing the catch into meal, oil, and solubles. There are at least two fisheries which in the past have indicated an interest in establishing reduction plants in this vicinity.

The cost of an average plant is about $600,000. It requires five boats costing about $150,000 each to keep a plant supplied, making a total capital investment of $1,350,000. A plant of this size will process about 100 million fish annually into 1,200 tons of solubles, 7,000 tons of fish scrap, and 4,000 tons of oil. At current prices of $100 per ton for solubles, $120 per ton for scrap, and $160 per ton for oil, the total annual value of the products will average about $1,600,000. Allowing 10 percent for depreciation and amortization, net value of products added to the economy by one plant each year will amount to $1,465,000. Due to competition, it is most likely that at least two plants will locate in the vicinity, adding a total of $2,930,000 to the economy each year. About 66,000 tons of fish would be brought in over the proposed channel annually.

5. SHRIMP INDUSTRY

Over the past 2 years an average of 1,700 tons of shrimp were brought into Delcambre, requiring 18,000 tons of ice for refrigeration. Estimates by shrimping interests indicate that at least an equal volume of shrimp and ice from other ports to the east would move over the channel, giving a total of 3,400 tons of shrimp and 36,000 tons of ice annually.

6. POTENTIAL TRAFFIC FROM OFFSHORE OIL FIELDS

Potential traffic to and from the offshore fields involves an estimate of drilling rates in the area which would be served by the proposed channel. This area extends southward into the gulf approximately 85 miles to the 400-foot contour and embraces approximately 4,000 square miles.

The Chase Manhattan Bank of New York has estimated the offshore oil and gas reserves of Louisiana to be at least 10 billion barrels. The Oil and Gas Journal estimates these reserves at 12 billion barrels, or 40 percent of the total proven reserves of continental United States.

On the basis of area, at least 20 percent or 2 billion barrels of this oil will be produced from wells which can be most economically served from Freshwater Bayou. Over a 50-year period production would average 40 million barrels annually, or about 110,000 barrels per day. Although the methods of transporting oil from offshore wells will probably change considerably in the future, it appears reasonable to assume that at least 10 percent or 570,000 tons of oil would be barged through the proposed canal each year. Savings on transportation of this oil should amount to at least 4 cents per barrel, or about $160,000 annually.

The Oil and Gas Journal of February 11, 1957, estimates the drilling program offshore of Louisiana at 3,650 wells in the next 5 years. Again on the basis of area, at least 146 of these wells will be drilled off of Freshwater Bayou. About 3,200 tons of supplies are required to drill one 10,000-foot well. At the rate of 146 wells per year, potential traffic in oilfield supplies is estimated at 467,000 tons, or an estimated increase of 211,000 tons over present traffic.

It is estimated that supplies flow to an offshore well at an average rate of 125 tons per day. Drillers have estimated that an adequate canal in this area would result in savings of from $90 to $300 per day per well in transportation costs. From these figures the additional potential savings would range from $152,000 to $506,000 or an average of $329,000 annually.

SUMMARY

The annual benefits to be derived from all operations due to improved navigation facilities in the Freshwater Bayou area are summarized as follows:

	Total traffic (tons)	Total benefits
Oil industry	1,037,000	$1,326,000
Menhaden industry	66,000	2,930,000
Shrimp industry	39,400	150,000
Grand total	1,142,400	4,406,000

These figures clearly show the urgent need for the proposed channel, and the great economic benefit which can be accomplished by its construction. The shallow depths of the existing route make it impossible for the heavy marine equipment being used to be based at nearby ports. All operations are presently conducted at excessive costs and risks. Failure to provide this facility will only continue to deny the full benefits of the intracoastal canal to the central Louisiana coast, and handicap the development of Louisiana's oil and fishing industries.

Senator ELLENDER. Next?

Colonel LEWIS. Mr. Chairman, I would like to present next Mr. Caruthers, chairman, Waterways Development Committee, Chamber of Commerce of the New Orleans Area.

Senator ELLENDER. All right, Mr. Caruthers; you may proceed, sir.

STATEMENT OF N. L. CARUTHERS, CHAIRMAN, WATERWAYS DEVELOPMENT COMMITTEE, CHAMBER OF COMMERCE OF THE NEW ORLEANS AREA

Mr. CARUTHERS. Mr. Chairman, my name is N. L. Caruthers. I am chairman of the Waterways Development Committee of the Chamber of Commerce of the New Orleans Area.

I have been directed to appear here in the interest of navigation. I think it would be repetitious or redundant for me to go into the importance of navigation to the city of New Orleans. I think all of you gentlemen understand that, as everyone else in this room. You asked us to brief our remarks, and I shall do just that.

The CHAIRMAN. May I interrupt the witness?

Mr. CARUTHERS. Yes, sir.

The CHAIRMAN. Senator Ellender, in 1945 the southern Governors' conference was held at New Orleans, at which time I was its chairman. I was invited to talk to the New Orleans Chamber of Commerce. I told them at the time that, with proper coordinated effort, in my judgment the port of New Orleans in 50 years would be the port handling more commerce than any other port in the United States.

I want to say that I have been highly gratified with what I have been listening to here today about developments and I want to congratulate those, all of those who have been at work developing this tremendous natural resource and say that it looks like New Orleans, with the adjacent areas being developed in conjunction with it, may get there before the 50-year period that I talked about in 1945.

Go ahead.

Mr. CARUTHERS. Thank you, Senator.

Senator ELLENDER. Senator Kerr, I wish to say that last week we had quite a meeting in New Orleans where the whole Louisiana delegation was honored for its work in the Congress. I said then that the time is not far off when New Orleans will pass New York City. I am glad to know that you believe as I do.

Proceed.

Mr. CARUTHERS. Thank you again.

The CHAIRMAN. You see, I made that statement in 1945, before I knew of the tremendous energy and activity and leadership of Allen Ellender and also of the cooperation of the people there and of their delegation in the Congress, but it is quite interesting to see the development going along on the basis that looked to me at the time to be possible.

Mr. CARUTHERS. We would like to have you come back again and speak to us.

The CHAIRMAN. You know politicians go where invited and stay where well treated.

Mr. CARUTHERS. I don't know any better place to be well treated than New Orleans.

The CHAIRMAN. I don't, either.

Mr. CARUTHERS. Pardon me.

Our chamber of commerce goes on record favoring many of these projects spoken of early by Mr. Myers and Colonel Lewis. I was delighted, Senator Ellender, to hear you say at the outset that we would be given an opportunity to file a detailed statement a little bit later. I was going to ask permission to do just that. We will meet your January 15 deadline. I do, however, have a statement here from the president of the chamber of commerce, Mr. Sumter D. Marks, Jr.

Senator ELLENDER. When I said January 15, at the latest. If you can file it before, it will be appreciated because in the meantime those who are in charge of this record will be gathering all the information, and quite a lot of duplication may be eliminated, so if we can have it earlier, say January 1, we will appreciate it.

Mr. CARUTHERS. We will do our best to get it to you by Christmas.

Senator ELLENDER. Good.

Mr. CARUTHERS. I do have a statement, however, as to industrial and residential uses by waterway from the chamber of commerce. I do have that statement with me and I would like to file it for the record.

Senator ELLENDER. Without objection, your statement will be filed at this point in the record.

(The statements follow:)

STATEMENT BY N. L. CARUTHERS, CHAIRMAN, WATERWAYS DEVELOPMENT COMMITTEE, CHAMBER OF COMMERCE OF THE NEW ORLEANS AREA

The Chamber of Commerce of the New Orleans Area is a nonprofit, community-wide organization dedicated, among other objectives, to the economic development of the Mississippi Valley, State of Louisiana and, in particular, the New Orleans area. This organization has over 5,200 members who are representatives of the business and professional life of the New Orleans area. From its beginning in 1913, the chamber has vigorously promoted and supported the development of domestic and foreign waterborne commerce on the Mississippi River and its tributaries.

I had the honor and the pleasure of representing the chamber of commerce at the hearing held by your committee in Alexandria, La., on December 1, 1959. At that time I presented an oral statement on behalf of the chamber of commerce on the immediate and future requirements of water resources development in the Mississippi Valley. At that time Senator J. Kerr granted our committee an extension of time until January 15, 1960, to submit a written statement.

The port of New Orleans, situated as it is at the crossroads of this Nation's shallow draft waterway system, namely the Gulf Intracoastal Waterway which stretches from the Mexican border at Brownsville, Tex., to Carrabelle, Fla., and the Mississippi River system which encompasses such tributary streams as the Missouri River, the Ohio River, and Tennessee River, the Cumberland River, the Arkansas River, the Ouachita River, and the Red River, is vitally interested in the future development of our Nation's principal river basin area. Our interest in the development of these basins lies not only in their navigation potential but also in the principals of cooperation that must be brought to bear in the development of multipurpose facilities. The economy of the port of New Orleans is to a great extent directly dependent upon the development of these upper river areas and, therefore, the basinwide concept of multipurpose water resource development envisioned by many farsighted individuals in the development of such principal waterways as the Ohio, Mississippi, and Illinois Rivers must be implemented to provide for the orderly development of such underdeveloped streams as the Arkansas, Red, and Ouachita Rivers.

In the year 1958 waterborne traffic flowing through the port of New Orleans amounted to a total of 51,711,671 tons. Domestic river traffic ingressing and egressing from the port of New Orleans accounted for approximately 22 million tons. Imports and exports through the port of New Orleans accounted for approximately 14 million tons, the balance being attributed to coastwise, local, and intraport traffic. It is readily apparent that the life blood of the port of New Orleans is largely dependent upon the fruitful development of our upper river basin areas. Work on the orderly development of our major river basin areas has been carefully worked out in a historic cooperative undertaking by the Corps of Engineers, the Bureau of Reclamation, and city and State agencies. The concept of multipurpose water resources development, in addition to providing a plentiful supply of water for navigation, also should include:

1. Flood protection.
2. Pollution abatement.
3. Development of recreation and wildlife facilities.
4. Hydroelectric power development.
5. River channel stabilization.
6. Improvements necessary for navigation.

Under a planned and orderly system of development, which is now being implemented in many of our river basins, all of these objectives are highly desired and obtainable.

Low-cost barge transportation to the port of New Orleans is daily making available substantial benefits to the industries and citizens of our upper Mississippi Valley area. Farmers can realize dollar-and-cents benefits from the lower cost shipment of grain to our elevator at the port of New Orleans by barge. Supporting this statement is the fact that grain shipments by barge to the port of New Orleans increased 21.76 percent in 1959 over the previous peak year of 1958. Iron and steel producers shipping their products from the mills in the Pittsburgh area through the port of New Orleans are benefiting and in turn consumers are reaping transportation savings. The chemical industry situated

in and near the port of New Orleans is benefiting from savings in the movement of chemicals and petroleum products by barge. The development of our Nation's waterways has resulted in industrial growth which requires the services and stimulates the development of other transportation media. Dependable barge transportation in the Mississsippi Valley permits not only lower water carrier rates but it brings transportation forces into healthy competitive relationships to give a very wide area a lower freight rate structure than it would otherwise enjoy. The eventual benefits of barge service are so broad as to provide the entire Mississippi Valley Basin area with a more favorable and advantageous rate structure. Because industries which utilize barge transportation frequently have serious need for an adequate source of water in their manufacturing processes, more industry will be attracted to these areas when our underdeveloped river basins are ultimately controlled, making available a dependable year-round streamflow. Inasmuch as navigation is a nonconsumptive user of water resources, the requirements of water navigation often may be met without additional construction costs, such improvements being the byproducts of more extensive development for flood control, water supply, pollution abatement, and/or the development of recreational and wildlife facilities.

As a basis for comparison of what will happen with the development of a dependable navigation channel, permit me to call your atttention to what happened on the Gulf Intracoastal Waterway when adequate depths were made available for navigation. When construction was started in 1929 it was optimistically predicted that it would ultimately carry 5 million net tons of traffic annually. That figure was exceeded even before transportation became possible over the full length of the waterway. Upon completion of the canal near the outbreak of World War II, it was carrying in excess of 17 million tons a year. In 1958 the waterway carried a total of 46,007,718 net tons of cargo, 31 million tons of which are attributed to the section of the canal from New Orleans to the Sabine River, and over 7 million tons from New Orleans to Mobile Bay. In other words, tonnage over this waterway is almost 10 times greater than was first estimated, and because of the rapid advancement in the technology of water transportation there is now an apparent need to widen and deepen the Gulf Intracoastal Waterway at the earliest possible date.

New Orleans, because of its strategic location at the crossroads of our great inland waterways system, and deep draftship channel serves as a terminal or exchange point for traffic emanating in the Mississippi Valley and destined for points east or west on the Gulf Intracoastal Waterway, and for foreign export or import. New Orleans, the second largest port in the United States, can attribute its greatness to a large extent to a compatible water transport system. Over 75 percent of all tonnage handled on the Mississippi River from Minneapolis to the mouth of the Passes traverses that section of the river between Baton Rouge and the Gulf of Mexico. It is expected that by 1975 tonnage volume over this section should triple. The banks of the Mississippi River below Baton Rouge are now being called the Ruhr of the South. We have only to look back in the last decade to bear out the truth in this statement. The rapid growth in industrialization of this area necessitates the immediate modification of the existing navigation project from New Orleans to Baton Rouge to provide for a minimum depth of 40 feet. The authorized deepening of the Southwest Pass to a 40-foot depth over a bottom width of 800 feet is a dire necessity. The transportation of bulk materials dictates the use of large vessels than have heretofore been used in marine transportation. These huge ocean carriers, often exceeding lengths of 800 feet and beams of 100 feet, require operational depths of at least 40 feet. Because of recent advancements in ship construction, it is expected that within the next decade ships drawing up to 45 feet will be in common usage in the bulk transportation trade. If the port of New Orleans and its surrounding industrial area is to continue to progress at the same rapid pace as the last 10 years, adequate depths to insure the full development of water transport economics must be provided. As a necessary adjunct to the Mississippi River system, the Corps of Engineers are presently constructing the Mississippi River Gulf Outlet Tidewater Ship Channel along the banks of which will be made available great tracts of land for industrial as well as terminal development. If the port of New Orleans is to expand and grow as presently

envisioned by the farsighted leaders in our chamber of commerce, the board of commissioners of the port of New Orleans, and various city and State officials, it will depend primarily on the orderly multipurpose water resource development of our underdeveloped basin areas. In making your committee recommendations for the future development of this Nation's water resources, we urge you to give due consideration to the long-range effects that such development will have on the city and port of New Orleans. Furthermore, we sincerely believe that if the development of commerce on our underdeveloped streams is retarded in this critical period, the whole economic growth potential of not only their respective basins but also the New Orleans area may be retarded.

Capital investment in sound water resource development projects is perhaps the best investment we as a Nation can make. For each dollar spent in the development of our Nation's water resources, the public accrues economic benefits far in excess of the money spent. We of the chamber of commerce of the New Orleans area feel that great progress has been made, particularly in the last decade on water resources in the United States. The successful development and growth of the port of New Orleans must be attributed in large part to this water resource development and we urge that Congress continue to appropriate necessary funds to continue this sound program of water resource development.

In closing, please permit me to again thank the members and staff of the Senate Select Committee on National Water Resources for permitting the chamber of commerce of the New Orleans area to submit this statement at this late date.

Senator ELLENDER. All right. Next, Colonel.

Colonel LEWIS. Mr. Chairman, I would like to supplement that presentation made by Mr. Caruthers with a statement received by me from the office of the mayor of the city of New Orleans. With your permission I would like to file this for the record.

Senator ELLENDER. It will be filed at this point for the record.

(The statement referred to follows:)

CITY OF NEW ORLEANS,
November 25, 1959.

Mr. CALVIN T. WATTS,
Assistant Director, State Department of Public Works,
Baton Rouge, La.

DEAR MR. WATTS: We have been contacted by Col. William H. Lewis, planning coordinator for the Board of Commissioners of the Port of New Orleans, and requested by him to furnish the Senate select committee, through you, a statement by the city of New Orleans concerning water resources activities within the scope set forth in the questionnaire of the Senate Select Committee on National Water Resources at field hearings dated September 3, 1959.

We have discussed the aims and scope of the Senate select committee problem with those department, board, and commission heads within Orleans Parish that we feel are qualified to offer comments on such a project.

These individual departments, boards, or commissions have been advised by me to report any supplemental data they feel necessary directly to the member of your coordinating committee who would be more directly involved within their specified field.

Generally speaking, we would like to present to the Senate select committee some of the points that we feel must be taken into consideration before accurate data could be collected on a local level to determine overall needs and policies to be developed in connection with water resources activities.

In view of the problem of water pollution we feel that a study should be made to determine the extent and controls necessary to prevent water pollution of the Mississippi River, Lake Pontchartrain, Lake Borgne, and ground water beneath the city of New Orleans. In connection with the last item, and because of a growing tendency throughout the New Orleans metropolitan area to utilize ground water for such purposes as air conditioning, industrial uses, and in some instances recreational uses, we feel that a survey on this specific item

should be made to determine the quantities of ground water available and those quantities that will be available in the future. We feel that on this specific subject of ground water, the effects are far reaching inasmuch as it could, through uncontrolled use, remove such quantities that the effect would be felt upon adjoining agricultural areas.

We also feel that in addition to the normal pollution of the Mississippi River and Lake Pontchartrain, there is a possibility and high probability of contamination of the existing ground-water supply and lake waters because of inadequacy of sewage disopsal within the metropolitan area of New Orleans. This is important when the fact that the average depth of wells in the area not served by a public water supply ranges approximately 300 feet.

We feel that study should be made regarding a source of potable water available for the metropolitan area of New Orleans other than the Mississippi River. As you are probably aware, the city of New Orleans experiences from time to time an intrusion of salt water by the Mississippi River from the Gulf of Mexico which can and does, at these times, affect the water-supply system of the city. Consideration should be given to the supply of Mississippi River water available from the upper reaches to overcome the effects of such an intrusion as well as the previously mentioned possibility of additional fresh-waters sources.

We feel that as part of any water resources activity study, the matter of flood control should be seriously studied, particularly in relation to those areas of Orleans Parish and adjoining parishes that are subject to possible inundation from high water because of hurricane conditions. We feel that in addition to property damages and health hazards that can be sustained on such occasions, the economic welfare of those engaged in trapping, fishing, and hunting can be seriously impaired by the damage that would be done to wildlife and fishing.

We are aware of the studies that have been made and are being made by the Corps of Engineers concerning possible flood control facilities for Lake Pontchartrain. We feel that these studies, in addition to being incorporated into the water resources study, should be expanded in view of development on both the north and south sides of Lake Pontchartrain that has taken place since the initial study has begun.

Although considerable progress has been made regarding the construction of the tidewater ship channel and the proposed shipping terminal in the eastern portion of metropolitan New Orleans, which development will certainly be of interest to the committee from the viewpoint of navigation in relation to water resources activity, we feel that further study should be given to this point of water resources in order that the full utilization of water transportation for the entire Mississippi Valley through the Mississippi River port of New Orleans can be better analyzed and proper steps taken to effect the most efficient and beneficial use of water transportation.

As you are probably aware, within the metropolitan area of New Orleans, Lake Pontchartrain is used to a great extent for recreation. We feel in conjunction with this item further development of recreational beaches in conjunction with floodwater protection around the periphery of Lake Pontchartrain would certainly be necessary to realize a full utilization of the local water resources.

In summary, we feel that the matter of water resources activities at a local level should be studied and investigated on an inventory basis to determine the following:

1. Fresh-water supply—prevention of salt-water intrusion from the Gulf of Mexico and possible sources of fresh-water supply other than the Mississippi River at New Orleans.
2. Ground-water supply—availability and extent.
3. Water pollution—extent, source of pollution, and controls necessary for elimination of pollution.
4. Floodwater protection—critical areas subject to inundation and the effects therefrom as well as possible procedures to eliminate such hazards.
5. Water recreation—metropolitan needs and methods of utilization of existing water facilities.

6. Water transportation—potential of the development of the tidewater ship channel and shipping terminal as well as any additional navigational channels needed for Mississippi River Valley commerce.

It is requested that you present these views and suggestions to the Senate select committee at its hearing at Alexandria, La., on December 1, and that these observations, comments, and suggestions be made a part of the record of that public hearing.

Very truly yours,

GLENN P. CLASEN, *Acting Mayor.*

Senator ELLENDER. The following brief has just been handed to me and it shall be placed in the record at this point.

(The brief referred to follows:)

BRIEF SUBMITTED ON BEHALF OF ABBEVILLE HARBOR AND TERMINAL DISTRICT

Marine transportation is conceded to be the most economical form of transportation, and navigation interests are vitally concerned with the ever-increasing need for conservation and equitable distribution of the water supply of Louisiana. These needs are primarily felt in these three vital areas: (1) national defense and security; (2) offshore oil operations and industries; and (3) commercial fisheries and sportsmen.

One of the most pressing reasons for maintenance of an adequate water flow into Vermilion Parish and southwest Louisiana is the need of our national defense and safety for water navigation routes. At the present time there is a stretch of some 144 miles along the Gulf Intracoastal Waterway from Morgan City to the Calcasieu River where there is no suitable channel connecting the Intracoastal Waterway and the Gulf of Mexico. With the control of Southwest Pass to Vermilion Bay looming ever nearer in order to create a fresh water reservoir in the Vermilion Bay area, the vital need for a channel from the Intracoastal Waterway to the Gulf of Mexico in the Freshwater Bayou area is increasingly urgent for defense purposes. During World War II enemy submarines lurked off our Louisiana coast in the Gulf of Mexico, harassing shipping in the gulf, with a resultant loss of many tons of shipping. There is no reason to believe that in the event of a future war such a situation could not again exist with even more disastrous results than were felt in World War II. The use of the submarine today to launch atomic missiles on our inland cities is entirely possible. This menace and others just as vital to our national defense can be lessened with adequate water navigation routes.

The increase of activities in the offshore areas of southwest Louisiana has been tremendous, with 190 marine drilling rigs operating at the last report. The ratio of success in offshore operations (1 producer for every 2.8 wells drilled) points to the fact that this figure will increase at a rapid rate. Those who are closely connected with the fertile offshore operations speak of it lasting 50 years or more. These 190 marine drilling rigs require various services which are primarily furnished in the most economical way, marine transportation. If the waterways of southwest Louisiana, where the bulk of offshore operations are conducted, are not maintained at proper levels, the future of the tremendous offshore operations, and necessarily the economy of the area, will be vitally affected.

Commercial shrimpers and fisheries are also heavy users of the waterways and would be adversely affected if further efforts are not undertaken to maintain a certain and adequate supply of water in the main bayous, rivers, lakes, and bays of Vermillion Parish and southwest Louisiana.

Menhaden plants are interested in the vast, untapped menhaden fishing grounds in the Gulf of Mexico off Vermilion Parish, and the primary reason for their failure to locate in Vermilion Parish can be traced to the fact that there is not a safe, short route to the Gulf of Mexico to be found between Lake Charles and Morgan City. With the establishment of these menhaden plants in Vermilion

Parish, a great need for an adequate water supply for navigation purposes will be immediately felt. (Reference: Brief submitted by Freshwater Bayou Navigation Association to Corps of Engineers at hearing on proposed Freshwater Bayou route, held at Abbeville, La., March 27, 1957. See also report of Louisiana Department of Public Works submitted to Corps of Engineers at hearing had at Abbeville, La., March 27, 1957.)

Along the Louisiana coast in the Vermilion Parish area are to be found some of the Nation's best deep sea fishing areas, which at this time are virtually unused. These areas remain scarcely touched because of a lack of a safe, landlocked route to the Gulf of Mexico from the Intracoastal Waterway. With such a route available sports fishermen would have easy access to these great deep sea fishing areas, and would be assured of safe harbor in case of severe weather in the gulf. The availability of such a route would be of tremendous importance in the economy of southwest Louisiana in the Vermilion Parish, La., area.

Colonel LEWIS. We call next on Mr. W. C. Herbert, executive director, Greater Baton Rouge Port Commission.

Senator ELLENDER. All right.

STATEMENT OF W. C. HERBERT, EXECUTIVE DIRECTOR, GREATER BATON ROUGE PORT COMMISSION

Mr. HERBERT. Thank you very much, Colonel Lewis.

Senator Kerr, Senator Ellender, Senator Hart, my name is W. C. Herbert, executive director of the Greater Baton Rouge Port Commission, with general offices located at Port Allen, La. I am appearing in behalf of the Greater Baton Rouge Port Commission and the Baton Rouge Chamber of Commerce.

The port of Baton Rouge, while one of the newest of the gulf ports, is rapidly taking its place as a major port not only on the gulf but in the Nation.

Baton Rouge has been a port for many years, but with the bulk of her traffic being handled at private facilities. The year 1952 saw creation of the Greater Baton Rouge Port Commission and the beginning of a new era for Baton Rouge and the entire surrounding area.

The port commission, originally authorized to issue bonds and incur debt up to $15 million, initially expended some $12½ million for a 2½ million bushel capacity grain elevator; and 8-million-gallon tank terminal; a general cargo wharf and transit shed; together with the necessary land; 14 miles of railroad; access roads; etc. These facilities were in operation and complete in late 1956, the same year the original legislative authority for the issuance of bonds was increased to $50 million.

Today, the port commission has expended some $36 million. Capacity of the grain elevator now stands at 7½ million bushels—the largest single grain elevator on the gulf, and to the port area has been added a new ultramodern public commodity warehouse of some 100,000 square feet.

The new Baton Rouge barge canal and terminal has become a reality with the wharf being complete and in operation since May 1959. This affords Baton Rouge and the area with the finest slack-water facility to be found on the Mississippi River system.

The bulk-handling terminal at Burnside, La., was purchased and has now completed its first full year of operation—far surpassing the traffic potential originally forecast. Over a million and a half tons of bulk traffic will be handled in 1959, and the estimate for 1960 is about 3 million tons. This facility affords one of the finest handling facilities for bulk ores, concentrates, and other commodities of bulk nature that can be found.

Attendant with construction of all these facilities has been the rise in tonnage handled at the port of Baton Rouge, as well as increased number of ships arriving and departing annually.

Baton Rouge, in 1952, handled some 14,473,503 million tons of waterborne traffic as compared with 20,923,180 tons in 1958. Today, Baton Rouge is Louisiana's second largest port and among the top 20 of the Nation.

During fiscal year July 1, 1954, through June 30, 1955, some 325 ships engaged in foreign commerce were handled at the port of Baton Rouge as compared to over 600 ships during fiscal year 1958. This represents a 45-percent increase in tonnage handled, and an 84-percent increase in the number of ships arriving and departing.

Another significant factor pointing to the future potential of the port of Baton Rouge is interest displayed by the various steamship lines. In just 2 years the port has secured three regularly scheduled berth-line services, operated by major interests, and present indications are that several more will be added in the near future.

This tremendous increase in the volume of traffic handled did not just happen—it was planned—and the Greater Baton Rouge Port Commission continues to look ahead and prepare for additional waterborne commerce.

A glance into the future for only a decade or so indicates general cargo facilities possibly triple those presently available, together with an additional grain berth. In the Devil's Swamp area, where the first 2½ miles of channel of the Baton Rouge barge canal and terminal has been dug, numerous industries will be located and, therefore, will require additional wharves and dredging of the remaining 2½ miles of channel.

The past few years have proven that the Baton Rouge area, with its attendant port facilities, have only scratched the surface of a vast potential which we believe makes its future assured.

In conclusion, let me state that the Greater Baton Rouge Port Commission stands substantially behind all of the suggested programs advanced by Colonel Lewis, of the port of New Orleans.

Thank you very much.

Senator ELLENDER. Thank you. Any questions?

Who is next?

Colonel LEWIS. Mr. Dale Miller.

Senator ELLENDER. All right, Dale.

STATEMENT OF DALE MILLER, EXECUTIVE VICE PRESIDENT OF THE INTRACOASTAL CANAL ASSOCIATION OF LOUISIANA & TEXAS

Mr. MILLER. Gentlemen of the committee, my name is Dale Miller. I am executive vice president of the Intracoastal Canal Association of Louisiana & Texas.

In the complex economic society of today the need for the most effective utilization of our water resources has become more apparent with each passing year, and your committee is performing an extremely useful public service in developing, through regional hearings, essential information on the availability and requirements of water for all useful purposes, and in awakening the people to the importance of this problem.

As your hearings now reach the coastal States on the gulf they focus attention on a particularly important chapter in the story of water: its use in transportation. Although the inland waterway system of our country contributes impressively to the economy of many regions, nowhere is its importance more manifest than here on the gulf coast. Along a coastline of nearly 1,500 miles, sweeping in an arc from southern Texas to southern Florida, there exists today a highly developed complex of navigable waterways, consisting of deep sea channels, and shallow-draft canals, both natural and manmade, which move commerce in the manifold millions of tons over distances of many billions of ton-miles each year. The impact of this water transportation on the prosperity of the gulf coast is enormous.

Although these ports and waterways are dispersed over a wide area, they are integrated all the way from the Mexican border to the west coast of Florida by the Gulf Intracoastal Waterway, a navigation facility which has become widely known as the most remarkable artery of transportation in America. First authorized by Congress on the expectation that it would ultimately develop approximately 5 million tons of commerce a year, this waterway is now carrying in excess of 46 million tons a year, or more than 9 times the amount predicted for it. In addition, it directly connects and serves 9 of the Nation's 15 largest seaports from the standpoint of tonnage.

The importance of the Gulf Intracoastal Waterway is further attested by the fact that it has achieved by far the highest benefit-cost ratio of any waterway in the United States. In a study undertaken by the Chief of Engineers at the direction of the House Appropriations Committee, it was found that the Intracoastal Canal had achieved the remarkably high ratio of $14.80 in benefits for every $1 in costs. This figure was more than twice the average for the major waterways in the country, and nearly five times the average achieved by all waterways. Furthermore, it was found that the savings in transportation costs achieved by the Gulf Intracoastal Waterway amounted to $83 million annually, and that figure for a single year exceeded all funds expended by the Federal Government in the construction, operation, and maintenance of the waterway throughout all the years of its existence.

I am sure you gentlemen are fully aware of the fact that these significant savings in transportation costs reflect only one phase of the waterway's importance. The existence of the Intracoastal Canal has been a major factor in the transformation of the gulf coast from a virtual wilderness into one of the world's most rapidly growing petroleum and chemical empires. It has been a major factor in the development of hundreds of new industries, representing capital investments in the billions of dollars, providing employment for many thousands, tax revenues in many millions, and otherwise greatly stimulating the economic development of a vast area of our Nation.

So rapidly has the industrial economy of the gulf coast developed in recent years it seems almost incredible that the Gulf Intracoastal Waterway was completed to its present dimensions only 10 years ago. First developed as a 5- by 40-foot project—that is, 5 feet deep and 40 feet wide—it then became improved to 9 by 100 feet, and eventually deepened and widened to 12 by 125 feet—and at each stage of its development it was generating far greater tonnage than had been anticipated.

I realize that most of these facts are familiar to the members of this committee and its experienced staff, but even those of us closest to this transportation phenomenon need to be reminded of them from time to time in order to maintain a proper perspective on the importance of this use of water to our gulf-coast economy. And we must hold to that perspective in order to evaluate our potentialities for the future.

To begin with, it is evident that the appropriations made by the Federal Government in the construction and improvement of these waterways have represented the soundest type of investment of Federal funds. Proof in support of that statement is overwhelming. That being the case, it is our opportunity to determine, through investigations such as that being undertaken today, how additional public benefits may be derived from a further wise investment of Federal funds.

It should be clear at the outset that the Gulf Intracoastal Waterway itself, and a number of its tributary streams, as well as certain deep-draft channels serving our major ports, would produce substantially greater savings in transportation costs, and further encourage industrial development, if increases in their dimensions are effectuated. As to the Intracoastal Canal, the district offices of the Corps of Engineers in New Orleans and Galveston are nearing completion of a study to determine what deepening and widening of the main channel between the Mississippi and the Rio Grande may be justified. While it may appear presumptuous to anticipate the findings of the Corps of Engineers, we have no doubt that such increases in dimensions will be found to be necessary to accommodate the enormous and constantly increasing commerce. We can anticipate similar findings with respect to studies of increased channel dimensions of certain tributary streams and access channels of both deep- and shallow-draft types.

An important development in recent years has been the expansion of the Intracoastal Canal system through the development of navigation of both tributary streams into the hinterlands, and access channels outward to the gulf. The tributaries provide an extension of the benefits of water transportation to inland areas, and the channels outward to the gulf are becoming increasingly important because of the development of natural resources on the Continental Shelf.

To achieve the economic benefits which will accrue from increased channel dimensions and continued expansion of the navigation system along the gulf coast, it will be necessary, of course, for Congress to provide adequate appropriations in the years ahead. But there are problems other than the actual appropriation of funds with which we shall all be concerned. So rapidly is our industrial economy developing that serious thought should be devoted by Congress, in my opinion, to some method of shortening the long and tortuous civil functions procedure. The process of developing navigation facilities from the original surveys through the eventual appropriation of construction funds generally spans years of time, and what is even more serious is the fact that the process generally requires the same inordinate amount of time when it merely involves a modification of an existing facility, when the need and the merits are clearly apparent. While I fully recognize that ample precautions must be taken against the possible authorization of projects of doubtful merit, I think we can all agree that ways should be found to expedite the construction of needed and useful public works.

As one method of achieving this desired result, we recommend that Congress adopt the policy of enacting an authorization bill each year in the same manner that an appropriations bill is enacted annually. Such a policy would contribute to a more orderly public works program, and at the same time diminish the captious "pork barrel" criticism which is directed at the large omnibus bills developed every 2 to 4 years. Authorizations of public works should become a normal and regular function of Congress just as appropriations for public works have always been. We also believe that the long civil functions process could be further shortened by the appropriation of more realistic amounts for surveys, thus enabling the Corps of Engineers to expedite its initial studies.

We recommend further that legislation be enacted permitting the corps at its discretion to undertake the construction or improvement of small navigation projects prior to authorization. We are familiar from personal experience with many small projects, some costing as little as $30,000 or $40,000, which were delayed for years by the long process of review at various levels of the Corps of Engineers, the Bureau of the Budget, and other agencies, and eventually by congressional committees, when it was obvious to all concerned that the work needed to be done and that the benefits would far exceed the trivial costs. We respectfully submit that it is an unproductive use of skilled manpower, ranging from a staff member of the corps all the way to a busy member of a congressional committee, to require them

over a period of years to study projects of such simplicity and modest cost. Some provision should be made for the prompt construction of such routine work.

In these nationwide hearings the principal objective of your committee, and of those of us who are privileged to appear before you, must be to determine as best we can some projection of the water requirements of our country in the years ahead. Having no gift of clairvoyance, we can base our predictions for the future only on the practical experience of the past, coupled with our seasoned judgment on the continuance or acceleration of trends. If we set a projection date as 20 years from now, would we be extravagant in suggesting that the rate of growth during that period in the future would be any less than that of the similar period in the past? I think not. Indeed, we would be remiss in our obligation to the next generation if we seriously underestimated either their potentialities or their needs. As to navigation, for instance—and again using the Intracoastal Canal system as an example—I can point out that the commerce moving over the waterway 20 years go amounted to 6½ million tons, as compared with 46 million tons today. The rate of growth, therefore, has been some 2 million tons a year. If that rate of growth is projected to a date 20 years from now—and certainly there is no reason why it should not be—then we can anticipate that the commerce then moving over the waterway will be in the neighborhood of 90 million tons a year.

An awareness of this demonstrable progress imposes an obligation on our political leadership to think in terms of a marked expansion of our public works program. Far from adhering to a restrictive no-new-starts policy, we must move aggressively to meet this challenge with more substantial investments in the water resources of our Nation. A considerably greater percentage of our annual budget should, in my opinion, be allocated in the years ahead to this essential activity. In no other manner can we discharge this obligation to our Nation's future welfare and security.

In conclusion, gentlemen, permit me to express my appreciation for the opportunity to express these views to you today. I convey to you also the appreciation of the membership of the Intracoastal Canal Association for this manifestation of your continuing keen interest in the navigation problems of our Gulf States, and we pledge our full support to your constructive efforts.

Thank you very much.

Senator ELLENDER. Thank you, Mr. Miller. Any questions? If not, next witness.

Colonel LEWIS. This is Captain Buck, sir, representing the Inland Waterway Common Carriers Association.

Senator ELLENDER. All right. Proceed, sir.

STATEMENT OF E. J. BUCK, ON BEHALF OF INLAND WATERWAYS COMMON CARRIERS ASSOCIATION OF CHICAGO, ILL.

Mr. BUCK. Mr. Chairman, Senator Ellender, Senator Hart, my name is E. J. Buck. I am vice president of Coyle Lines, Inc., head-

quartered in New Orleans, and I speak on behalf of the Inland Waterways Common Carriers Association of Chicago, which represents the common-carrier bargelines operating on the Mississippi, Missouri, Ohio Rivers and their tributaries and the Gulf Intracoastal Canal.

Let me say, first, that the common-carrier bargelines believe that hearings such as your committee is holding are an absolute necessity if America's water resources are to be used sensibly and to their maximum capacity. It is obvious that with so many interests—Federal, State, and local agencies, port authorities, individual companies, and unions involved—that someone has to take the leadership to draft overall recommendations which will serve as a planning guide for the rest of this century. Those of us who live in Louisiana have been privileged to know for many years of Senator Ellender's genuine interest in this field.

Our association chose Louisiana as the State in which to testify because two of our companies have operating headquarters here and this State has a long history of developing water resources.

The regulated common carriers are important users of the waterways—because of this, may I take this opportunity to correct an erroneous statement which has from time to time plagued the common carriers as they have tried to cooperate with you in thinking through and planning for the maximum use of our God-given water resources.

The regulated inland water carriers believe that there has been a serious misunderstanding of the role of the certificated carrier. ICC Commissioner Howard Freas, in a speech in October 1958, said:

> It should be noted that approximately 90 percent of the traffic moving over the inland waterways is exempt from ICC jurisdiction, and revenue data covering such traffic are not available.

The attached study (exhibit A), which has been brought to the attention of the ICC, shows that in 1957 an estimated 39 percent of the traffic on the Mississippi and its tributaries and the Gulf Intracoastal Canal was handled by certificated carriers subject to the Interstate Commerce Act.

While the exact percentage is necessarily based on an estimate of average ton-mile revenue, we believe the estimates are very close to actual. If anything, the traffic that is subject to regulation is underestimated. There are large tonnages moving on the Illinois River subject to regulation by the State of Illinois which, because they are intrastate movements, are not reflected in the annual reports of the carriers to the Interstate Commerce Commission as ICC-regulated traffic.

It is obvious that any policies based on such a serious misunderstanding of the extent of regulation can be seriously damaging to the certificated lines. We are currently studying the 1958 figures of the Corps of Engineers to bring our study up to date.

Our lines carry traffic, both bulk and regulated, over 13,524 miles of inland waterways, all of which fall within the jurisdiction of your committee. You'll realize that any estimate we give must be in the

nature of an informed guess. This is because there are so many factors that are outside of the control of the water carriers.

I have been asked to tell you of the projections of river traffic for the next 20 and 40 years based upon the opinions of the common-carrier bargelines. These lines see the following percentage increase or decrease in (1) carrying capacity; (2) gross freight revenue.

The forecasts by our members vary widely. They fall into three main categories. Some feel that the common carriers will carry the same amount of freight and have the same carrying capacity as today. This envisions no substantial growth on the part of the respondents, and even this conservative reply is dependent upon the absence of cutthroat discriminatory practices by the railroads.

Others feel that the common carriers will increase their services in approximately the same proportion as national income increases. They state, for example, that inland waterway transportation, exclusive of that on the Great Lakes, increased from 22 billion cargo ton-miles in 1940 to about 110 billion cargo ton-miles during 1958. They feel that the increasing need for inland waterway transportation will continue at least as rapidly as the general level of industrial production and the gross national product. The continued flow of industries to inland waterway sites could accelerate this increasing need. Thus they feel that in 20 years a proportional increase of 90 percent and in 40 years an additional proportional increase of 100 percent are possible. However, all our members join in stating that these estimates would certainly be reversed sharply downward or modified considerably if legislative or administrative changes are made; the result will be to restrict the use of the inland waterways for transportation.

A parenthetical comment here might be in order and it is this: The heaviest increase in traffic, if it is allowed to occur, will be in the movement of dry cargo inasmuch as the large volumes of liquids will continue to move by pipeline.

Still others feel that the inland waterways are capable in the future of rendering far greater service in carrying capacity and gross freight revenue. They estimate that increases closer to 200 percent are possible in the next 20 years, assuming that barge lines will not be harassed by hostile legislation. These people feel that if consuming and manufacturing groups that want to use waterway transportation are allowed to do so, then a substantial increase in equipment will be needed. Even these optimists, however, seem to be very fearful as to the future since experience has taught them that common-carrier bargelines are not left alone to perform their inherent function in providing the lowest cost transportation available.

These rivers which you are studying can carry a gross tonnage far in excess of the fondest hopes of past generations. This has been the case in the last 20 years and it may be assumed to be similarly true if certain conditions are met in the future.

We in Louisiana and the neighboring States know that in the next 20 and 40 years there will come to exist different and new industries

and products; for example, some years ago we did not have the big petrochemical business in this area that we now have.

We can see from the above that there should be a steady and sound growth in our business to serve consumers and business organizations in 22 river States in mid-America. Barge transportation is generally recognized as the most inexpensive form of transportation. Undoubtedly as business moves to the rivers it will do so in about the same percentage as it has in the recent years. There are no signs of letup and there is every indication that business concerns all over the country are trying to cut transportation costs so that they can make a product at a more reasonable price. The common-carrier bargelines assist in this by providing economical water transportation. This means we are fighting against inflation where it counts and where consumers and businesses benefit.

If I had the time today I would like to discuss a number of river developments of interest to you and analyze some of the products which are moving on the river or which will in the future. All I can do today is list a few high points of thoughts I have on some aspects of river transportation.

There is evidence that for commodities adapted to river transportation there is no lower cost mode than barges. In the context of the increased worry about inflation and the serious problems of increasing cost generally, there are bound to be in the next 20 and 40 years frequent reviews of costs. Every time this has happened in the past, water transportation has been able to render a still more effective public service. As the pressure of higher costs increases, the barge industry is bound to be asked to offer more service.

In terms of long-range trends in supplies of raw materials for American industry, it has been shown that Latin America is becoming an increasingly important area. Bauxite, iron ore, manganese ore, chrome ore, and copper are being developed in South and Central America. These commodities are brought to South American ports, and the logical entry port of America is the gulf area. Thus in the next 20 to 40 years this basic shift of supply can be expected to increase the dependence of American industry on river transportation. The initial reduction of these ores at the seacoast in the New Orleans area, and the transportation by barge of the refined ore can be expected to grow.

In this country, grain and grain products are produced in the center of our great country and shipped to its borders. The cheapest way to do this is by river. As long as the population continues to increase in the world generally, there will be a demand for surplus American grain. The cheapest way to get the grain to market is by water. As there is more demand for the grain, there will be more demand for this type of transportation service.

The St. Lawrence Seaway in the long run is expected to stimulate industrial growth in the mid-America area. Inland waterways will share in the growth of demand to serve consumers and business in the Nation.

The price of natural gas has been increasing. To the extent that it increases, coal becomes more important as a substitute fuel. Common-carrier bargelines have had some inquiries from the Southern States for prices on coal shipped down the river.

It is entirely probable, in view of the industrial development in the South, that whole new markets for coal will be developed in the Southern States that will require greatly expanded river fleets.

The barge industry has been pleased at the requests for service for the substantial new tonnages made available by the chemical industry. Like others in the area, we find difficulty in spelling some of the polysyllabic materials that have developed out of nowhere as major bargeloads. The future of this industry is wide open, but we know one thing—the foundation stones of this industry are carbon, chlorine, and sulfur. These foundations, in the form of sea-water salt, chlorine, sulfur, oil, and gas, are readily to be found in enormous quantities either in the gulf area or readily accessible to it by ocean transport. This speaks well for river traffic in this field for the future.

There is value in comparing the development of the Mississippi with the Rhine. The Rhine is a much more mature river in the sense of industrial development. The Ohio is now called America's Ruhr and the Mississippi could be next. Steel in St. Louis is only a beginning for a great industrial complex that will, as population increases and production develops, stretch along the Mississippi. The need for economical transportation of bulk materials from all over the world to support this complex will develop rather rapidly in the next 20 to 40 years. The Rhine has become the industrial main stem of Germany—so we can see the Mississippi and its tributaries becoming more and more the industrial main stem of America.

There will be a number of technical changes in the river industry during the next 20 to 40 years. The creation of new and modified equipment will obviously provide new business for those who will develop innovations, but of much more importance is the interrelationship these technical improvements will have with the improved waterways as you envision them.

The deeper pools above the many new dams may well result in deeper draft equipment operating at higher speeds. You may be sure that the deeper pools will have an effect on the design of equipment which will be built in the years ahead.

The size of individual barges will still be decided by the individual operational needs involved, but I predict that the general trend will be away from small barges which have formerly been the standard barges. It seems clear that if the equal tonnage can be moved in fewer barges the hours wasted in moving barges at the dock and in making up tows would be substantially eliminated.

More of the fleets which will utilize the waterways you are studying will use the full 1,200 feet of available length in the locks. These longer and larger fleets will represent more of a problem in the making up of tows at the limited terminals now available. To be able to cope with larger fleets, towboats in the years ahead will have to

have more power; also greater speed, because the bargelines often have been handicapped by slowness in the past. Greater speed will be entirely possible through the larger and deeper sections of the pools previously mentioned. The greater speeds and the larger fleets will necessitate, I believe, more reliable communications between approaching fleets and will cause traffic-control problems.

I do think that in the years about which we are talking more use will be made of clear, short-range VHF radios maintaining a continual listening watch on the particular frequency established for approaching and passing boats. The move to larger fleets with towboats having more power will cause operators on these waterways to be much more conscious of the handling and towing efficiency of towboats. More consideration will be given to design efficiency in the fields of propulsion and rudder effectiveness. I might add that much greater rudder effectiveness will be required for larger fleets moving at higher speeds.

For a large tow with a speed of 7.5 miles per hour, at present 20 hours are necessary to move through certain locks on the Ohio River. With the improvements now planned this period of time will be reduced to 13 hours. Travel time, therefore, in certain pools, such as the Markland Pool, will be slashed by at least one-third by the elimination of about 7 hours of lockage time. You can imagine what speeding up of service like this will do along the rivers and how many more people should logically use water transportation which, instead of being slow, will then become considerably quicker.

During the next 20 to 40 years I predict there will be two clear developments which will change waterway requirements. One will be heavier and larger integrated tows and the second will be that these tows will move at higher rates of speed than is now the case. These two factors will require navigational equipment which does not exist today except in the area of the Great Lakes and near the ocean. This involves further development and perfection of automatic pilots, radar, and depth finders. The new towing systems will lend themselves ideally to maximum speeds with a minimum of wave wash and other troublesome conditions.

Your committee will undoubtedly be looking into the necessity for improved and expanded terminal facilities along the waterways. If the maximum use of the improvements which the Federal Government has seen fit to make for many reasons are to be realized, this will be one of the areas where constructive cooperative planning must take place in the future between the various groups that serve the river States.

A good example of constructive water resource planning is the widening and deepening of the Gulf Canal. The development of this canal is a perfect example of what is needed in thinking years ahead as to river improvement. The people who proposed the canal in 1905 had broad vision of the benefits that this project would bring. But even they could not imagine that the canal would protect American shipping from German submarines in World War II. Nor did the Member of Congress who anticipated traffic of 5 million tons a year

expect that this figure would be exceeded even before the canal was completed.

Each time that the canal has been improved as to depth and width, the tonnage on the waterway has practically doubled.

The common-carrier bargelines are ready and eager to put to the maximum use for the public benefit the Nation's waterway improvements. As improvements have been made, as in the case of the Gulf Canal, the common carriers have built newer and better equipment in order to render better and quicker service. The 14.8-to-1 benefit ratio, which has come from lower transportation costs to the consumer, is a direct result of the foresight of the planning done in 1905.

The brief report I have given you today may sound good at first glance, but it is predicated not only on the normal imponderables of life—Will there be peace or war? Will there be prosperity or recession?—but on something much closer to the men and women who serve on America's rivers and those companies and their employees who are dependent upon economical water transportation for a fighting chance to compete in distant markets. It is this.

Your committee, in its wisdom, and the Congress for many years have joined with the Executive in encouraging these rivers which existed long before we did to be used in the most practical manner to contribute to America's economy. However, the common-carrier bargelines respectfully draw to your attention and, through you, to your colleagues in the Congress and to the press covering these hearings today, the fact that there are powerful forces at work in this Nation seeking to undo the constructive things for which you stand. These forces, largely spearheaded by railroads and their allies, seek to set up cutthroat rates along the waterways so that river traffic in the future, in spite of all you can do and say and plan, will be destroyed, just as it was in the 1920's. The way this is done can be seen every month at the Interstate Commerce Commission.

Since the enactment of the 1958 Transportation Act there has been a noticeable decline in suspensions on behalf of river State industries and carriers. You may wonder why the suspension procedure is so important to the growth of water transportation.

The process of suspensions of rates is often a complicated one, but for our discussion today this simple explanation should do the job. A certain carrier, let us say a railroad, informs the ICC that it is changing its charges on the movement of, let us say, sugar up and down the Mississippi. The ICC can just say, "All right, go ahead," and often does this without a hearing or argument. However, if other carriers and shippers find a rate to be unfair and/or destructive, the ICC Suspension Board is able to tell the railroads to hold up on putting the new rate into effect. When this happens, a rate is suspended until such time as hearings are conducted. Then facts are gathered and, in theory, a close examination is made as to whether a new rate is in the public interest or is designed to hurt other carriers and consumers while benefiting only the initiating carrier.

In a number of instances, since the passage of the Transportation Act of 1958, suspensions have not been granted due to what we believe

may be a misinterpretation of the wishes of Congress as the act was passed. It is important to the development of river transportation that the Government agencies which are concerned with the regulation of transportation rates do not disregard the intent of Congress. Certain Government agencies and officials have assumed the attitude that what you gentlemen are concerned with is of far less importance to them than their own efforts to try to create regulations which allow the railroads to do just as they please regardless of the harm that it does to business located near the river, consumers that use these products, workers that make them, and bargelines that move them.

You gentlemen, who came long distances to conduct these hearings in person rather than send down some representative on your behalf, by your presence have proven you are interested in the continued growth and prosperity of water carriers because these very carriers help implement the overall objectives of your committee to make the best possible use of the Nation's God-given water resources.

I do hope you will ask your friends on the Senate and House Interstate and Foreign Commerce Committees and the ICC to think carefully about what they should do to help create a climate which will be consistent with what your committee is trying to do in these water States. Our hopes to provide improved and extended services all along the river will be just hopes if certain railroad practices are not declared illegal by the ICC and the Congress.

I have strictly limited my remarks to navigational aspects of waterway development.

I have not gone into the other many benefits which accrue to consumers, farmers, shippers, railroads, and other groups from the development of our waterways. You have and will be hearing about these benefits from the many other groups that appear before you.

In conclusion, I would like to say that I hope you will have time, before your committee writes its final report next year, to study what will happen to water carriers who use the facilities you are encouraging if the railroads have their way. I would like to say that the common-carrier bargelines know that there are members on your committee whose longtime interest in water transportation would certainly make them keep this warning in mind during the years ahead.

Thank you, gentlemen. Are there any questions?

Senator ELLENDER. Thank you. Any questions?

The CHAIRMAN. I want to say this to the witness, Senator Ellender, that on this committee are two representatives from each of these committees: Public Works, Interior and Insular Affairs, Agriculture, Interstate and Foreign Commerce. In other words, the Interstate and Foreign Commerce Committee of the Senate has the same representation of this select committee as does Public Works, Interior and Insular Affairs, and Agriculture.

It was the purpose of the Senate to see to it that that phase of the Senate's responsibility was fully represented in the personnel, operation, study, report, recommendation of this committee.

Mr. BUCK. Thank you, sir. That is encouraging.

Senator ELLENDER. So that the point you made will be, of course, emphasized when the reports are made.

Mr. BUCK. Thank you.

(The exhibit referred to follows:)

EXHIBIT A.—*Proportion of traffic on the Mississippi River and tributaries and the Gulf Intracoastal Canal handled by certificated carriers, year 1957*

	Unregulated	Regulated	Total
1. Freight revenues of certificated carriers	$32,883,293	$79,244,228	$112,127,521
2. Estimated revenue per cargo ton-mile, mills	4.02	4.29	
3. Certificated carriers, estimated ton-miles	8,179,923,000	18,471,848,000	26,651,771,000
4. Total Mississippi system and Gulf Intracoastal ton-miles			68,126,390,000
5. Percent of total handled by certificated carriers	12.01	27.11	39.12

Sources: 1. Annual reports of 34 certificated carriers to ICC. 2. U.S. Engineers, "Waterborne Commerce of the United States," pt. 5, "National Summaries, Year 1957," pt. 2, "Gulf Coast, Mississippi River System, 1957." 3. Individual reports of carriers to IWCCA.

Detailed explanation of computations from U.S. Engineers reports

	Cargo ton-miles
Mississippi River system, including Ohio River and tributaries (inland-internal-local-intraport, p. 205, pt. 2)	54,768,579,000
Port of Chicago, Ill., (inland-internal-local-intraport, table 7, pt. 5)	601,869,000
Tampa Harbor (35.6 mi. average haul×1,794,113 tons of internal and local shipment)	63,870,000
Gulf Coast Waterway, including Black Warrior and Tombigbee	15,920,499,000
Less foreign and coastwise ton-miles as shown below (St. Marks River to Mexican border, table 6, pt. 5)	3,228,427,000
Total	12,692,072,000
Grand total, cargo ton-miles, Mississippi River system and Gulf Intracoastal Canal	68,126,390,000

To eliminate deep-sea-vessel ton-miles

Waterway	Average miles	Coastwise and foreign tons	Cargo ton-miles
St. Marks River	6.8	1,105	8,000
Port St. Joe Harbor	12.9	1,523,341	19,651,000
Panama City Harbor	2.7	387,943	1,047,000
Pensacola Harbor	7.7	275,780	2,123,000
McBee Harbor	31.9	11,535,728	367,990,000
Pascagoula Harbor	16.8	30,008	504,000
Gulfport Harbor	19.6	287,407	5,633,000
Atchafalaya River (Morgan City to gulf)	32.1	4,289	138,000
Lake Charles Channel		1,247	
Calcasieu River	20.3	8,857,164	179,800,000
Sabine-Neches Waterway	22.9	40,321,329	923,358,000
Houston ship channel	35.7	35,959,951	1,283,770,000
Texas City channel	7.9	9,106,608	71,942,000
Galveston channel	3.2	4,907,180	15,703,000
Freeport Harbor, Tex	3.6	3,156,219	11,362,000
Port Aransas-Corpus Christi	16.9	19,686,530	332,702,000
Brazos Island Harbor	11.6	1,094,515	12,696,000
Total cargo ton-miles			3,228,427,000

Senator ELLENDER. All right. Who is next?

Colonel LEWIS. Gentlemen, our testimony on navigation will be concluded by Mr. John Canerot, American Waterway Operators' Association.

The CHAIRMAN. I just want to put into the record that the members from the Interstate and Foreign Commerce Committee are its Chairman Magnuson, Gale McGee from Wyoming, Schoeppel, from Kansas; Scott, from Pennsylvania.

Senator ELLENDER. Proceed.

STATEMENT OF JOHN CANEROT, AMERICAN WATERWAY OPERATORS' ASSOCIATION

Mr. CANEROT. Senator Ellender, Senator Kerr, Senator Hart, ladies and gentlemen, my name is John Canerot. I am a southern regional representative of the American Waterways Operators, Inc., and nationwide representative of the shallow-draft water-carrier industry.

Our association headquarters is located in Washington, D.C., with regional offices in New York City and New Orleans.

Our association's president, Braxton B. Carr, has asked that I express his sincere regrets at his inability to attend this hearing here today. Unfortunately he is attending and presiding at one of our association's quarterly board of directors meetings in Jacksonville this afternoon.

Tugs, towboats, and tows operated by members of our association regularly ply the thousands of miles of inland waterways of our Nation, providing a dependable low-cost water-carrier service and returning to the Nation's economy untold savings in transportation costs.

Our association staff is in the process of preparing a comprehensive report for your committee's consideration detailing the present and expected future needs in use of our inland waterways by members of the shallow-draft water-carrier industry. We expect to complete and submit this report to the committee prior to the deadline established by Senator Ellender of January 15. However, should additional time be required due to the comprehensiveness of completing a report covering the whole United States and all of its navigable waters, we are hopeful that your committee will grant us a reasonable extension of time. However, at this time I do not feel that a request of this nature will be put forth. However, I would like to ask it if necessary.

Thank you, gentlemen.

The CHAIRMAN. All right, sir.

Senator ELLENDER. Does that complete navigation?

Colonel LEWIS. Yes, sir.

I would like to close by reminding the committee I have a telegram from Mr. Joseph M. Shelton, representing the American Association of Oil Well Drilling Contractors, who was originally sched-

uled to appear before your committee at this time. He is unable to be present and wishes to file a written brief with the committee at a later time.

Senator ELLENDER. That will be done.

(The statement is as follows:)

STATEMENT OF THE TRANSPORTATION COMMITTEE OF THE AMERICAN ASSOCIATION OF OIL WELL DRILLING CONTRACTORS

The American Association of Oil Well Drilling Contractors is a nonprofit, educational, and technical trade association, composed of approximately 500 member companies who own and operate about 2,000 oil-well-drilling rigs. These member companies are highly competitive, independent contractors who engage in the business of drilling exploratory and development oil wells for others. The members of this association drill approximately 75 percent of the oil-well footage in the continental United States, its offshore and inland waters. The average contract drilling firm operates about three drilling rigs. While such firms' investment in equipment is substantial, these companies are not "big business" in a relative sense.

The highly competitive and risky nature of the enterprise has caused this industry to constantly seek technological advancement and development. The industry's equipment and methods are revised to meet the conditions which develop in the search for petroleum reasources. One of the innovations of this development has been the design and construction of mobile drilling equipment upon submersible barges and other kinds and types of floating platforms or vessels. The primary employment of this type of equipment at the present time is in the gulf and western coastal areas of the United States. There is some possibility that such type of equipment will be employed within the Great Lakes region in the future.

Our industry is perhaps unique for the reason that our services must be applied where petroleum reserves are sought or located. Relocation of operations to meet impediments is not possible as it is with many other types of manufacturing or service enterprises. Unfortunately, our industry cannot predict with mathematical or engineering exactness what will develop in any given geographical area with respect to petroleum production. Many areas once condemned have since proved, with newer and better exploratory and development methods, to be exceptionally flush producers of petroleum. In view of this fact, the transportation committee of this association faces the task of protecting reasonable access for equipment used to provide our services in all areas where future development may occur.

The interest of our association in the comprehensive study undertaken by your select committee lies, therefore, in the area of preservation of navigation features of streams, bays, inlets, lakes, and marshes where conventional land-drilling equipment cannot be successfully employed in the prosecution of our work. History already shows that the tremendous amount of petroleum reserves discovered in such water areas would have been totally inaccessible without the use of floating equipment. We are firmly convinced that the future holds promise of more such reserves being discovered and developed within other water areas.

This association has on a number of occasions presented specific facts and economic data dealing with the effects which would be produced should a particular impediment to navigation be constructed. Your committee is, of course, familiar with the responsibilities of the U.S. Army Corps of Engineers in this field. We have found the corps to be extremely well qualified and efficient in the handling of such matters where the waterway or area was within its jurisdiction. Since the draft and design of some of our equipment makes possible its movement in many areas not normally classified as navigable to the extent required for corps supervision, we are sometimes before authorities without sufficient experience and knowledge to make the equitable adjustments necessary between interests. For this reason, we are particularly interested in this oppor-

tunity to make known to your committee that our industry does have navigational requirments.

We are not without regard for the needs of others respecting water and water usage, as well as those who have problems created by the presence of water at an unwanted location. We realize where there are conflicting interests, we shall have to compromise our needs in keeping with a proper balance of economic and social needs as between such interests. We would not be justly entitled to an audience if we did not assume such an attitude.

It is our earnest request that this honorable committee in its studies and deliberations remain conscious, as we know it will, of the need of preserving accessibility to other natural resources and the needs of navigational interests generally. In the event specific legislation is recommended as a result of your study, we request that you include a recommendation that adequate procedure be included to assure that navigational interests will be considered and properly protected.

Respectfully submitted.

JOSEPH M. SHELTON, *General Counsel.*

Colonel LEWIS. Thank you, sir. I would like to thank the members of the committee in behalf of all navigation interests for the indulgence in hearing our testimony. Thank you, gentlemen.

The CHAIRMAN. I want to thank you and your group for such a fine presentation.

Colonel LEWIS. Thank you, sir.

The CHAIRMAN. All right.

Mr. WIMBERLY. Mr. Chairman, with your permission I would like to call one of those who would like to leave early, as I explained to you outside of this hearing.

The Louisiana League of Women Voters—Mrs. Leo S. Terbush.

Senator ELLENDER. Very well, Mrs. Terbush. You may proceed.

STATEMENT OF MRS. LEO S. TERBUSH, LEAGUE OF WOMEN VOTERS OF LOUISIANA

Mrs. TERBUSH. Senator Kerr, Senator Ellender, Senator Hart, I am Mrs. Leo S. Terbush, representing the League of Women Voters of Louisiana. We have been studying the water problems on three levels of government, local, State, and Federal, for the past 3½ years.

Our State is blessed with adequate rainfall and an abundance of surface water. However, we have unique problems. Some of our parishes have had serious periods of drought, some have been flooded, some show serious signs of ground-water depletion. Other areas show signs of salt-water intrusion in ground-water supplies. Pollution of one kind or another has affected nearly all areas to varying degrees. Drainage problems in south and southwestern areas present a constant threat to the population.

Apparently no flood-plain zoning has been proposed. Urban and rural planning has been negligible. We are grateful for Public Law 660 which has enabled 28 municipalities to build sewage-treatment plants.

The CHAIRMAN. May I interrupt?

Mrs. TERBUSH. Yes.

The CHAIRMAN. Mr. Wimberly, will a representative of your State health department be before us with a report on the operation in the State under 660?

Mr. WIMBERLY. Yes, sir.

The CHAIRMAN. All right.

Mrs. TERBUSH. We are making headway toward checking pollution of our own making. This is not quite the case with water which comes to us from other States in polluted form.

Industry is in a state of expansion, especially between Baton Rouge and New Orleans. For this we are grateful, but careful vigilance and proper controls must be worked out.

Every effort should be made in the future to keep ahead of arising water problems to secure a well-balanced program to maintain adequate, clean water for agricultural, municipal, and industrial uses.

Moving on to the river basin or regional aspects of the problem, if we have ever been provincial in our thinking, that time has certainly passed. By virtue of our geographical location, and knowing that water movement is no respecter of political boundaries, we are forced to be concerned with the water problems of our neighboring States, and even with States well above us. What happens to water in those States will surely affect the water in Louisiana.

The Agricultural Research Department has made some startling predictions about our increasing population, nationwide. One very recent figure is that our present population of 177 million will become 235 million by 1975. This means that pressure on the land and all resources will create new problems and will augment the problems we have now. Good farmland is being gobbled up by urban development. Farmers are forced to areas which are not as productive. Over 10 percent of our Nation's choice land has become urbanized. Even with the scientific advances and improved methods of farming we have been able to increase yield by only 36 percent. From this point on upping production will be less sensational than in the past.

We can ill afford to have various Federal, State or local agencies working separately and at variance with each other. The time has come for the best brains available to be called into service for preparing long-range plans to protect the eroding countryside against the damaging effects of floods, to replenish our ground-water supply, and to secure the best land and water use for our coming generations.

We believe that more attention should be given to recreational areas. We believe that the Watershed Protection and Flood Prevention Act is a fine means of local, State, and Federal teamwork. It enables specialists and technicians in all concerned fields, engineering, hydrology, sedimentation, forestry, economics, and soil conservation to contribute to and participate in watershed work plans to improve small watersheds.

There has been a lack of uniform national policy and much inconsistency in the laws under which these agencies operate. There has been no coordinating body. There has been no solution to some technical problems. But time is running out.

The Department of Agriculture, Bureau of Reclamation, and the Army Corps of Engineers should all have equal authority in planning.

It is our hope that this committee will be able to find solutions to our water problems, to bring order out of chaos. We endorse the Resources and Conservation Act of 1960—S. 2549—which Senator Murray introduced in the 1st session of the 86th Congress. This bill could lead us in the right direction toward better planning and coordination. Also, we hope the Blatnik bill, H.R. 3610, can be passed in the coming session of Congress.

Again, let me say, time is running out.

Senator ELLENDER. Thank you very much, Mrs. Terbush.

The CHAIRMAN. Senator Ellender, I want to congratulate this fine lady on a statement she made, one observation which I must assume to be accurate, which is quite a significant statement. She said if we have ever been provincial in our thinking that time has certainly passed.

I am sure that is an objective to be hoped for, but one if applied to our Representatives from our various congressional districts and the Senators from our various States and made a reality on them, it would probably result in terrible casualties among them. So I am glad we do have some that have risen above the level of provincial thinking and it is my devout wish that their objective may be achieved by men who never will.

Senator ELLENDER. Next.

Mr. WIMBERLY. Now, Mr. Chairman, we pass to the field of industry. I would like to call Mr. Henri Wolbrette, exective vice president, Louisiana Chemical Association.

Senator ELLENDER. All right, Mr. Wolbrette.

STATEMENT OF HENRI WOLBRETTE, EXECUTIVE VICE PRESIDENT, LOUISIANA CHEMICAL ASSOCIATION

Mr. WOLBRETTE. Fine, sir.

Gentlemen, I am Henri Wolbrette and I am here today representing the chemical and petrochemical industry of Lousiana. As you doubtless know, this State has developed a new look in little over a decade.

We had been predominantly an agricultural State, taking pride in our ranking as one of the largest producers of cotton, of sugarcane, and other crops.

Now the accent has shifted and we talk in terms of the fastest growing industrial area in the country, or talk about our rank as the No. 2 producer of oil, of natural gas, of sulfur, and No. 3 producer of salt. You hear more talk today of the thousands of tons of chemical products or barrels of refined oil than you do bales of cotton or boxes of strawberries.

And, I might add, this industrialization of Louisiana could not have come at a more opportune time. There was the song of World War I fame, "How You Gonna Keep Them Down on the Farm After They've Seen Paree?" This process was repeated at the end of World War II and there was another factor—the ever-increasing mechanization of farms which caused fewer but larger farms and resulted in a major population movement.

As these displaced rural dwellers looked around for other pastures—green or gray—they were greeted by the sight of huge new industries moving into this State, in many cases moving into what had been rich farm sites. These new industries absorbed a great number of these displaced persons.

For example, let us take a quick look at the 13 parishes that lie along the Mississippi River in Louisiana. During the past 10 years, 31,791 new or additional workers were employed by new or expanding industries within these 13 parishes. Using a formula developed by the U.S. Chamber of Commerce relating to the effect of new industrial jobs, these 31,791 new jobs meant for those parishes 94,128 more people, 35,616 more households, and with them the additions to retail sales, taxes, and the other factors that spell prospertity.

During the period from 1946 through 1958, more than $2 billion has been invested in new and expanded industry in Louisiana. This averages out to $170,601,000 per year over a 13-year period.

I might add that the payroll of the chemical industry in Louisiana was over $100 million in 1958 and the industry's purchases from local sources of materials, raw materials, and services was over $200 million. My figures are based on information furnished by 23 of the largest chemical manufacturers in the State and the three largest petroleum refineries.

There are many reasons for industry's selection of Louisiana as a site, but certainly one of the most important is the State's water resources.

Industry today must have water. Its uses by industry are manifold, but it is important to note that over 90 percent of the water withdrawn by the industry is used for cooling, and, on the average, well over 95 percent of this water is returned to its source.

The CHAIRMAN. Is it in any way polluted?

Mr. WOLBRETTE. When it is returned?

The CHAIRMAN. Yes, sir.

Mr. WOLBRETTE. There certainly must be a degree but the majority of the water used for cooling is returned simply a slight bit warmer than it is withdrawn. In the processed water there is bound to be some slight pollution, sir.

The CHAIRMAN. That represents a very small percent of the total?

Mr. WOLBRETTE. Extremely small, and I yield to Mr. Biglane, of the Louisiana Stream Pollution Commission, to go into that later, sir.

In other words, industry uses water, must have water, and yet it consumes very little percentagewise and the very water that may be used by a plant at Baton Rouge today may be used another day by a plant farther downstream, and on it goes until the river discharges into the gulf.

Today, Louisiana's chemical industry is situated mainly along the Mississippi, the Calcasieu, and the Ouachita Rivers.

The statistics given me by the 23 chemical manufacturers and 3 largest petroleum refineries show a current withdrawal of 1,500 million gallons a day. Of this, 1,380 million gallons a day is surface water and the remainder ground water.

I mentioned earlier that industry consumes less than 5 percent of the water it withdraws. It is interesting to note that recent studies

have shown that in the United States the water use is distributed 46 percent to irrigation, 46 percent to industry, and the 8 percent to public usage. Of the 46 percent for irrigation, 60 percent is consumptive and 40 percent nonconsumptive; of the 8 percent used by the public, 10 percent is consumptive and 90 percent nonconsumptive; of the 46 percent used by industry, only 2 percent is consumptive and 98 percent nonconsumptive.

Now, what I have said to this point might lead to the conclusion that as far as industry is concerned, there is no water problem in Louisiana. Such a conclusion would not be accurate because there is always the problem of distribution and time in water usage.

While water is presently plentiful along the Mississippi River, we must try to project what the supply—and demand—will be in 1980. And even today there are problems of salinity in the Calcasieu and the Ouachita.

In order to lay a foundation for discussion of the problems of the 1980's, we have obtained estimates from the chemical industry of their anticipated water needs 20 years hence. However, because of the ever-changing picture in this industry, I must add that these estimates are at best educated guesses.

The CHAIRMAN. Would you delete the word "educated?"

Mr. WOLBRETTE. The men who made them were very well educated, Senator.

The CHAIRMAN. All right.

Mr. WOLBRETTE. These estimates indicate that water needs will multiply threefold. Presently, the industries are withdrawing 1,380 m.g.d. of surface water. It is anticipated that this will increase to 4,130 m.g.d. by 1980. At present withdrawal of ground water is at a rate of 127 m.g.d. This will probably jump to 254 m.g.d.

This would give us a total withdrawal in 1980 of 4,380 million gallons per day compared with today's 1,500 million gallons per day.

I think it might be well to mention here that the chemical and petroleum industries in Louisiana use less than 25 percent of the total of industrial water withdrawn.

The CHAIRMAN. I don't understand that statement.

Mr. WOLBRETTE. There are many, many other industries in this State, sir.

The CHAIRMAN. How is that?

Mr. WOLBRETTE. There are many other industries that use the other 75 percent of water that is withdrawn.

The CHAIRMAN. Does that mean that, as of now, industries in the State are using 6 million gallons of water a day?

Mr. WOLBRETTE. My figure is 1,500 million gallons per day.

The CHAIRMAN. For your industry?

Mr. WOLBRETTE. For my industry, sir, we multiply by 3. We are using about one-quarter of it. It would be about 6 million gallons per day, sir.

The CHAIRMAN. That is the estimate of the current utilization of water by industry in Louisiana?

Mr. WOLBRETTE. Right, sir.

The CHAIRMAN. Do you at all indicate what the total of all industrial will be in 1980, or is your forecast limited to your own——

Mr. WOLBRETTE. That is limited to my own, sir.

The CHAIRMAN. All right.

Mr. WOLBRETTE. And there is another important factor we must not overlook. The statistics I have presented reflect only existing industry here. Who can tell what the next 20 years will bring in new industry?

We know that, for the 20-year period from 1939 through 1958, chemical manufacturing in Louisiana increased 1,023 percent and there is no reason to anticipate any lessening of the acceleration. Already this year, chemical manufacturers have sought over $25 million in tax exemptions for new and expanded facilities, and just a few weeks ago came the announcement that another of the country's great industries, the Hercules Powder Co., is moving into our State.

So, if industry is to continue to prosper and continue to make its way into this area, it is quite apparent that the wisest possible use be made of our water resources.

This leads us to the problems of water resources; what might be done to solve present problems as well as those we can anticipate in 20 years.

There is presently an adequate flow in the Mississippi River and steps should be taken to make certain this condition in maintained.

There should be a continuation of upstream reservoir development along the Missouri, Ohio, and upper Mississippi. These reservoirs should include storage for low-water releases to prevent or, at least, to minimize salt-water intrusion in the lower Mississippi.

It is incumbent that studies be made to determine the feasibility of distributing water from our two largest streams, the Mississippi and the Atchafalaya, to those areas of this State which have all the natural attributes for industry save one—sufficient water.

Many of our smaller streams have flows sufficient to support industry only short periods of a year. If water from our large rivers could supplement these streams and create a dependable flow, we could well open new industrial areas in this State.

The CHAIRMAN. Do you think that could be done and still maintain adequate prevention of salt-water intrusion not only on the Mississippi but the other streams to which diversion would be made?

Mr. WOLBRETTE. I am talking now mainly of the Mississippi and the Atchafalaya. There are certainly——

The CHAIRMAN. You said here.

Mr. WOLBRETTE. Yes, sir, but there is certainly a sufficient flow in the Mississippi provided there is the addition in the low-water period of these reservoir reserves to take care of the salt-water intrusion. At one time it came up; I think at Cano water intake in New Orleans.

The CHAIRMAN. Your last sentence there was if water from our large rivers could supplement these streams and create a dependable flow we could well open new industrial areas in this State, and I was asking my question to get your judgment on the degree to which that could be done and still maintain an adequate safety factor not only in the new areas that would thus be opened up but also in the Mississippi and the Atchafalaya themselves.

Mr. WOLBRETTE. Senator, I can only say that the people who are well versed with this problem and who I leaned on for guidance assure me it can be done.

The CHAIRMAN. I see.

Mr. WOLBRETTE. Going back to the new industrial areas in the State, I am thinking particularly of the area south of Alexandria and westward to the State line. Sufficient water would serve multiple purposes—industry, navigation, agriculture, and others.

In connection with interstate streams from the size of the Mississippi to the smaller ones, river compacts will play a part in the development and apportionment of water. This could be particularly true of the Red River, which traverses four States with water unsuited to most industrial uses on account of natural pollution from alkali flats in west Texas and Oklahoma.

This is an area where there is work to be done to eliminate this natural pollution and make this water fit for industrial and other consumption, and is a bigger problem than can be solved by any single State.

It is hard to generalize when it comes to discussing industrial water requirements, for the water must be tailored to suit the needs of the particular processing operation. However, one of the most desirable characteristics of an industrial water is that it be of uniform quality and composition throughout the year. Water which varies widely in its chemical and physical composition is harder to treat and requires constant attention to meet any of industry's rigid process requirements.

Controlled releases from upstream reservoirs of water improved to a usable quality could open up this area south of Alexandria and westward that I mentioned earlier.

In those areas where salinity or scarcity of surface water is such that industry must depend on ground water—in the Lake Charles industrial area, for example, the ground-water level is falling at a rate of 5 feet a year—steps should be taken to prevent further salt-water intrusion into ground water. This could be done in Lake Charles by construction of dams and reservoirs upstream on the Calcasieu. This would provide a fresh water supply and allow replenishing of fresh ground water.

This is extremely important because it has been shown time and again that, when an industrial area uses up its local water supply, it is faced with one of two decisions. First, it can curtail industrial expansion, or, second, it can continue the expansion of its industrial complex by competing for water outside its own watershed.

This places increasing importance on the sound management of our water resources and the continuing need for cooperation between municipalities, industry, and the pollution-control agencies.

Finally, I must mention the interrelationship between industry, navigation, and flood control.

Water for industry is multipurpose. It is needed for cooling, for processing, and certainly for transportation. American industry today must seek ways of cutting down production costs because of increasing competition from foreign countries which do not have our high standard of living, our high labor costs, and other economic factors. Water transportation presently is cheap, and industry locates where it is available. So industry has a direct relationship to navigation and is certainly concerned with navigational problems on our streams. There are many projects to improve and enlarge our water highways, including the project of the Louisiana Intracoastal Seaway Association, which certainly require close study and attention.

Then there is the matter of control of these streams. Industry, as I have said, builds close to water for many reasons. Because of this and because plant investments represent millions of dollars, industry wants to be assured it will be safe from the ravages of floods. What industry wants is an assurance that there is a year-round water supply of consistent quality and without the danger of floods and their incumbent damage to property and life.

Thank you, sir.

Senator, there is one area in Louisiana which at present has serious water problems. That is the Calcasieu area around Lake Charles, as far as industry is concerned. To explain that in technical detail I would like to call on Mr. Glendon Smith, who is technical assistant of the Cities Service Refining Corp.

The CHAIRMAN. I notice that Mr. L. D. Mann, of the Cities Service, is likewise here. Is your statement in addition to his or in lieu of his?

Mr. SMITH. In lieu of his, sir.

The CHAIRMAN. All right. Thank you. Your name is Smith?

STATEMENT OF GLENDON SMITH, TECHNICAL ASSISTANT, CITIES SERVICE REFINING CORP.

Mr. SMITH. Glendon Smith.

The CHAIRMAN. Thank you.

Mr. SMITH. Senator Kerr, Senator Ellender, Senator Hart, and gentlemen, I am Glendon L. Smith and employed by the Cities Service Refining Corp. in Lake Charles as a technical assistant.

The purpose of this report is to give the committee our appraisal of the water resources of Lake Charles industrial zone of southwest Louisiana and to outline a plan for their development to meet the future requirements of the area. Southwest Louisiana is a 10,000-square-mile area comprising 12 parishes which had an estimated population of 550,000 in 1956.

The Lake Charles industrial zone is located in the southern part of the central area of the Calcasieu River Basin. It is assumed to consist of a rectangular area, 18 miles east to west, and 12 miles north to south. Within it are located the city of Lake Charles and most of the major industries of southwestern Louisiana.

The presently developed industrial section has a gross area of about 25 square miles. Approximately half of the 150,000 population of the Calcasieu Basin live in the industrial zone.

The potential water resources of southwestern Louisiana are among the most abundant to be found in an equivalent area in the entire United States. Nevertheless, because the concentration of water use in the Lake Charles area by industry has created a local problem, the economic limits of the surface-water supply for cooling purposes have already been reached.

The CHAIRMAN. Let me ask you a question. What is the temperature of the water, on the average, as it is returned to the streams after use?

Mr. SMITH. Sir, I cannot give you an average, but it will range—in other words, in periods of high flow, high riverflow, it will probably be returned only a few degrees higher than what it was brought into the plant. I will give you a range of high flow to low flow of about

90° to maybe 110°. In a period of low flow is when the refineries or the industries get in trouble for cooling purposes.

The CHAIRMAN. What is your estimate of the maximum degree of water that is useful for cooling purposes at the plant intake?

Mr. SMITH. At the present time the industrial area of Lake Charles, sir, from into the plant and back into the river, about 800,000 gallons per day.

The CHAIRMAN. I did not mean the quantity of water. The temperature of the water—what is the maximum temperature of the water that can be taken into the plant for cooling purposes and it be an economic process? You say it is about 110° at discharge.

Mr. SMITH. At 105° we get in serious trouble, sir. We have to cut back.

The CHAIRMAN. In other words, if the temperature of the water is 105° or about, its usefulness to cooling has been greatly impaired?

Mr. SMITH. Diminished; yes, sir.

The CHAIRMAN. All right.

Mr. SMITH. That is due primarily when it is low flow, the water is corrosive and you cut back on the cooling of your water for corrosive reasons. Ground-water pumpage is increasing and the water levels are falling.

The CHAIRMAN. Did you hear the figure given a while ago on that?

Mr. SMITH. Yes, sir.

The CHAIRMAN. Five feet a year?

Mr. SMITH. Yes, sir; that is correct, sir.

The CHAIRMAN. How long can that rate be maintained without reaching the point where the ground water will be deemed to be pretty well exhausted?

Mr. SMITH. We estimate, sir, that our present abstraction rate, that is now around 105, we——

The CHAIRMAN. You mean 105 feet in depth?

Mr. SMITH. 105 feet below ground level.

The CHAIRMAN. That is where static level is now?

Mr. SMITH. That is our present rate of extraction. We think we can triple that extraction and have a static level, pump from a static level of approximately 380 feet below ground level, which is the maximum.

The CHAIRMAN. You think 380 feet depth would be the maximum?

Mr. SMITH. We would have to find something else by that time; yes, sir.

The CHAIRMAN. All right.

Mr. SMITH. However, these conditions can be effectively dealt with, and the growth of industry in the area need not be restricted by water-supply deficiencies in the foreseeable future. The principal source of future water supply is the common ground-water reservoir that underlies practically all of southwestern Louisiana. It is estimated that in 1958 the total demand for fresh water and ground water in southwestern Louisiana was 460 billion gallons.

The CHAIRMAN. Wait a minute. Say that again.

Mr. SMITH. That is per year, sir.

The CHAIRMAN. That would be, then, in the neighborhood of 1.25 billion per day?

Mr. SMITH. Right, sir.

The CHAIRMAN. All right.

Mr. SMITH. That is the total for fresh water and ground water.

The CHAIRMAN. 460 billion annual demand?

Mr. SMITH. Right, sir.

The CHAIRMAN. All right.

Mr. SMITH. It is expected that the present demand of 450 per annum for agriculture will rise only slightly; the municipal and domestic demand of 20 billion gallons may go up 50 percent, but the current industrial use of 30 billion gallons a year——

The CHAIRMAN. Of what?

Mr. SMITH. Of 30 billion gallons a year will probably rise by 200 percent.

The CHAIRMAN. Now, you just said——

Mr. SMITH. Yes, sir.

The CHAIRMAN. You just said 460 billion gallons a year.

Mr. SMITH. That is a total, sir, for southwest Louisiana.

The CHAIRMAN. What is the 30 billion?

Mr. SMITH. The 30 billion is the part industry uses in the process; 30 billion gallons per year.

The CHAIRMAN. Is that the consumptive use?

Mr. SMITH. Not circulation, sir; what they use in the process. That is not returned.

The CHAIRMAN. You are talking about the consumptive use?

Mr. SMITH. Right, sir.

The CHAIRMAN. That is the amount that is consumed each year and not returned to the streams as your total usage of 450 billion gallons a year continues?

Mr. SMITH. Right, sir.

The CHAIRMAN. All right.

Mr. SMITH. At Lake Charles plants circulate about approximately 800 million gallons a day from the lower section of the Calcasieu River for cooling purposes but the larger part of the year this water is brackish. In 1958 the total abstraction of ground water is estimated at approximately 190 billion gallons per year. Industry uses 30 billion gallons.

In 1980 the total pumpage by wells may amount to 270 billion gallons.

The CHAIRMAN. Per year?

Mr. SMITH. Per year, sir.

One of the areas of most concentrated areas of pumpage of ground water is within the Lake Charles industrial zone. This is a 25-square-mile area of land now occupied or owned by the principal industries in the zone and it is only one-fourth of 1 percent of the area of southwestern Louisiana. But the 20 billion gallons annual ground-water demand is 10 percent of the total.

The CHAIRMAN. Of southwest Louisiana?

Mr. SMITH. Of the total of southwest Louisiana; yes, sir.

It is estimated that by 1980 this demand will rise to 60 billion gallons per year, which would represent almost 23 percent of the estimated total ground-water use of the region at that time if ground water is available.

It is estimated that the maximum dependable ground-water supply which can be obtained from the 500-foot sand within the concentrated 25-square-mile area of the Lake Charles industrial zone is about 135 million gallons per day or 50 billion gallons per year.

90° to maybe 110°. In a period of low flow is when the refineries or the industries get in trouble for cooling purposes.

The CHAIRMAN. What is your estimate of the maximum degree of water that is useful for cooling purposes at the plant intake?

Mr. SMITH. At the present time the industrial area of Lake Charles, sir, from into the plant and back into the river, about 800,000 gallons per day.

The CHAIRMAN. I did not mean the quantity of water. The temperature of the water—what is the maximum temperature of the water that can be taken into the plant for cooling purposes and it be an economic process? You say it is about 110° at discharge.

Mr. SMITH. At 105° we get in serious trouble, sir. We have to cut back.

The CHAIRMAN. In other words, if the temperature of the water is 105° or about, its usefulness to cooling has been greatly impaired?

Mr. SMITH. Diminished; yes, sir.

The CHAIRMAN. All right.

Mr. SMITH. That is due primarily when it is low flow, the water is corrosive and you cut back on the cooling of your water for corrosive reasons. Ground-water pumpage is increasing and the water levels are falling.

The CHAIRMAN. Did you hear the figure given a while ago on that?

Mr. SMITH. Yes, sir.

The CHAIRMAN. Five feet a year?

Mr. SMITH. Yes, sir; that is correct, sir.

The CHAIRMAN. How long can that rate be maintained without reaching the point where the ground water will be deemed to be pretty well exhausted?

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It is estimated that the maximum dependable ground-water supply which can be obtained from the 500-foot sand within the concentrated 25-square-mile area of the Lake Charles industrial zone is about 135 million gallons per day or 50 billion gallons per year.

The yield of 135 million gallons per day is 2½ times the present abstraction rate and equals the total estimated demand by industry by 1974. Before that date is reached other sources of supply must be developed.

The CHAIRMAN. Or means of recharge?

Mr. SMITH. Sir?

The CHAIRMAN. Or means of recharge?

Mr. SMITH. Or means of recharge; yes, sir.

On the basis of the various projections of water use and availability of supply, it would seem at first that for many years there would be no serious water problems for us to face in southwest Louisiana. However, any increase in pumpage from wells will be accompanied by lowering of the ground-water levels. In the industrial zone at present for a total abstraction rate of 55 million gallons per day the static level at the two focuses of greatest pumpage within the heart of the industrial zone is about 105 feet below ground level. For an abstraction rate of 135 million gallons per day in 1947 these levels will drop to about 380 feet below ground level. Such a steep fall in hydrostatic head could well create the hazards of salt-water intrusion and land-surface subsidence. Low water static levels will also raise the cost of pumping water from the ground.

The CHAIRMAN. I want to ask you about that land subsidence. How much thought has been given to that?

Mr. SMITH. Sir, we have made a study on land-surface subsidence. Really it will be a problem; we think it will be a problem. It has happened in other parts of the world.

The CHAIRMAN. Already?

Mr. SMITH. In other parts of the world.

The CHAIRMAN. But not here?

Mr. SMITH. But not in our area; no, sir.

The CHAIRMAN. When do you anticipate that will become a problem in this process of reduction of that ground level?

Mr. SMITH. Sir, if it becomes a problem it will probably be around, I would say, after the static level reaches better than 300 feet.

Salt-water intrusion has occurred on a small scale in several parts of southwestern Louisiana. In the industrial zone the chlorides increased in the water pumped from the 700-foot sand by some industrial wells and the operation of these wells has been stopped.

In the heavily pumped 500-foot sand there is as yet little evidence of salt-water contamination. Studies have been made as to the possible sources of such intrusion and it is not considered that the saline of the 500-foot sand will rise sufficiently to affect its use for the next 10 years. However, the danger of deterioration of quantity of ground water in the area inevitably increases as the static level drops.

Land-surface subsidence has occurred in other parts of the world where geological conditions are similar to those prevailing in the industrial zone.

Certain measures and policies have been recommended and accepted by industry that will be conducive to the better development of their common source of ground water.

To meet still larger and unforeseeable local demand for fresh water or to ward off possible intrusions of salt water, it is estimated that

the zone 10 to 20 years from now may need a river water supply to supplement the well supply. The best source would be the West Fork of the Calcasieu River. The economic range in capacity of such a development we think would be between 50 and 100 million gallons per day. We estimate the cost for about 1,000 gallons delivered to be about 4½ cents and 3½ cents, respectively.

The CHAIRMAN. What do you mean, "respectively"?

Mr. SMITH. That is 500.

The CHAIRMAN. As to the rate?

Mr. SMITH. As to the rate, sir.

The CHAIRMAN. Whether it is 50 or 100 million?

Mr. SMITH. It is 50 or 100; yes, sir.

To develop such an economic supplementary river-water supply, two of the State water schemes are essential. These two water schemes have been discussed here this morning. These are the salt-water barrier on the Calcasieu River between Lake Charles and its confluence with the West Fork. And also the Sabine River development at the Toledo Bend Dam.

The CHAIRMAN. Would that provide a source of acceptable water?

Mr. SMITH. That will provide a source of acceptable water, sir.

We can then pump it from West Fork into the plant, sir.

The CHAIRMAN. What do you estimate the cost of your water now? Just roughly.

Mr. SMITH. Considerably less than that, sir. I would say about——

The CHAIRMAN. Less than 3½?

Mr. SMITH. Oh, yes, sir.

The CHAIRMAN. All right.

Mr. SMITH. Industry recommends the execution of these two projects.

Gentleman, we regret that the time after notification was insufficient to properly prepare an advanced brief.

The CHAIRMAN. I must say that the fine quality of the one you have prepared in the time that you have indicates that you really would have done something if you had had time.

Mr. SMITH. Thank you, sir.

Mr. WIMBERLY. Now, Mr. Chairman, I would like next to present Dr. John B. Entrikin.

STATEMENT OF DR. JOHN B. ENTRIKIN, HEAD, DEPARTMENT OF CHEMISTRY, CENTENARY COLLEGE

Mr. ENTRIKIN. Senator Kerr and Senator Hart, I am John B. Entrikin. I am head of the chemistry department of the college at Shreveport. I am appearing before your committee representing the seven corporations which produce paper or paper pulp in the State of Louisiana.

The CHAIRMAN. Where is your college?

Mr. ENTRIKIN. Shreveport, La.

To conserve the time of the committee I wil not read my report but will only point out certain highlights.

The CHAIRMAN. How many paper industries do you represent?

Mr. ENTRIKIN. Seven. These seven corporations, to save the time of the committee, have pooled their information and asked me to compile it and present it, which I have done.

We wish also to file a supplementary document, the 1958 report of the National Council on Stream Control, and also a speech by the president of the Institute of Paper Chemistry at Appleton, Wis.

I would like, sir, to briefly point out some of the highlights of the report which I am filing.

On the second page of the report, which I believe you have in front of you, you will note that the present usage of water by the paper companies of Louisiana totaled 151 million gallons per day, of which 80 million comes from surface waters and 70 million from wells.

Any construction which is currently planned will increase by 50 million gallons the amount per day, the amount of water needed by 1965—actually, I think, it will be by 1963. It is intended that all of this water will be from wells.

The CHAIRMAN. The additional?

Mr. ENTRIKIN. Yes, sir. By 1980 we are estimating and, of course, this is at best again an educated guess by educated people——

The CHAIRMAN. I wonder if you could clarify that statement for me? Is any guess made by an educated person an educated guess?

Mr. ENTRIKIN. No, sir. I wouldn't say so. Not always.

The CHAIRMAN. All right.

Mr. ENTRIKIN. It depends on whether they are guessing or not.

The CHAIRMAN. You were about to deprive me of the opportunity of making an educated guess. That is what I was getting around to.

Mr. ENTRIKIN. We will accept your educated guess, Senator.

The CHAIRMAN. All right. Thank you. Let me ask you: Is this well water you are talking about here from the same series of sands as those referred to by Mr. Smith?

Mr. ENTRIKIN. Part of them will be; yes, sir. Part of them will be. I was going to comment on that briefly in a moment. By 1980 it is expected that the surface water demands will be 185 million gallons per day and well water 254 million per day for a total by 1980 of 449 million gallons of water per day.

The CHAIRMAN. Which is almost three times your present use?

Mr. ENTRIKIN. Yes, sir. There is a question in my mind, certainly, as to whether or not this projected production from wells can be developed and maintained. Certainly, I doubt seriously that it will be true unless some way of replenishing these underground reservoirs is developed. So I would personally think that much of this well water may have to come from surface waters by 1980.

I will pass over the statistics relative to the people employed, et cetera, in the paper industry of Louisiana, the round figure is about 20,000 people employed directly in the paper industry.

The CHAIRMAN. That does not include any of the employees in the production of the raw material?

Mr. ENTRIKIN. That would include about 6,000 estimates of cutters of pulpwood and haulers of wood; yes, sir.

The CHAIRMAN. I see.

Mr. ENTRIKIN. There are about 13,000 direct mill employees, about 6,000 estimated in the woods, but it does not include allied industries.

These estimates are based on certain facts, these "educated guesses." One that the national production of paper, pulp, and paperboard will more than double by 1980; since Louisiana is producing trees faster

than we are cutting them, we anticipate that our growth here will be better than the national average.

There are certain points which these people of the paper industry would like to have particularly called to your attention. They are included in my report, but I would like to highlight them.

One is that it is the feeling of the people of the paper industry that any law in the future which creates reservoirs should have written into the law a clause specifying minimum flow rates from such a reservoir. It is the feeling that minimum flow rates are absolutely essential to downstream users in order that they may count on a certain definite flowage.

The quality of the water, as well as the quantity of the water, is particularly important to industries in general, and the paper industry certainly is included.

We are cognizant of the fact that the reservoirs which have been created—for example, in your State and on the Red—have materially reduced the amount of suspended solids in the Red River down as far as Shreveport, as an example. Certainly that is one thing that upstream reservoirs do accomplish, is reducing the amount of suspended solids. That can be, of course, improved and increased in the future.

Also, the matter of salt content from brackish waters, oilfields, et cetera, is a matter of concern.

Like Mr. Wolbrette, speaking for the petroleum industry, I would like to point out that the paper industry is a large user of water but not a great consumer of water. The paper industry uses the same water over two or more times to a great extent. At least 75 percent of the water taken into a papermill is used two or more times before it is discharged. So they are attempting to consume water as much as possible.

The CHAIRMAN. Conserve, you mean?

Mr. ENTRIKIN. Conserve; yes, sir. I am sorry. Thank you, sir. Over 90 percent, varying estimates, but slightly over 90 percent of the water taken into the papermill is released, so that the amount of water consumed is less than 10 percent of the water intake.

We would also like to point out the fact that the paper companies are large owners of timberlands and that the timberlands are capable of using the water as it falls to maintain it for ground water and for plant respiration, to restore it to the surface streams at a later date. So that, actually, the paper companies through their timber holdings probably contribute more even-flow water, at least to an area, than they consume.

It is also the consensus of the management of the various paper companies that the control of water supplies will best be accomplished by State and interstate compacts and agreements since it is felt that the local and regional people will have a better understanding of local conditions and local needs. So they are strongly in favor of interstate compacts and State control of water supplies and the problems related thereto.

We appreciate the opportunity of presenting this information before your committee. Thank you.

The CHAIRMAN. Are you going to submit an additional statement?

Mr. ENTRIKIN. No, sir; not unless there are questions. I am submitting this.

The CHAIRMAN. I am tremendously interested in your observation about the control of the water by the States.

Mr. ENTRIKIN. It is the feeling of the management of the paper companies that through the State and through interstate compacts such as are already in effect on the Red River Valley that that can be accomplished with people who are more familiar with the local conditions than could be accomplished by somebody from greater distances.

The CHAIRMAN. Suppose that the States of North Dakota, Montana, and South Dakota would enter into an interstate compact to control the waters of the Missouri Basin. What do you think Iowa, Missouri, and Nebraska would think about that?

Mr. ENTRIKIN. Certainly there are problems there that are national and would have to be worked out on a national basis. I am not denying that.

The CHAIRMAN. In other words, you would approve the basic principle of rendering unto Caesar the things that are Caesar's and so forth?

Mr. ENTRIKIN. I think so; yes, sir.

The CHAIRMAN. I must say it is a very difficult problem, is it not?

Mr. ENTRIKIN. It certainly is.

The CHAIRMAN. It is a very difficult problem. Now, Louisiana is tremendously fortunate in some ways in that you do not have to account to anybody downstream for how much of the water you consumptively use.

Mr. ENTRIKIN. That is true.

The CHAIRMAN. At the same time you are affected tremendously by both the beneficial and consumptive use of this water upstream by the States.

Mr. ENTRIKIN. That is true.

The CHAIRMAN. I think that the welfare of the country is going to depend on a broad-scale use of the privilege of interstate compact but also there must be in the picture an appropriate participation in that program of control by the Federal Government.

Mr. ENTRIKIN. I think that is true; yes, sir.

The CHAIRMAN. Nobody is any more devoted to the basic element of States rights and the principle of States rights than I am, and I think that it should be implemented to the greatest degree possible, consistent with the general, overall national requirements. I have been intrigued as I have heard many witnesses in these hearings take the position, without any equivocation, that each State should be permitted to have full control of the water resources that either originate in it or traverse it—believing that such situation might bring on a condition such as we got into in the early sixties and never have completely gotten over.

Mr. ENTRIKIN. I don't think it could be done on a straight-line basis, but since many of the problems are local, they can be handled on a State basis. Many of the others certainly can be handled, we think effectively, on an interstate-compact basis. Certainly some of them will have to be the general policy, will have to be a national policy; yes, sir.

The CHAIRMAN. Thank you very much for a good statement.[1]

(The statements of Dr. John B. Entrikin and John G. Strange follow:)

STATEMENT OF DR. JOHN B. ENTRIKIN FOR THE PAPERMAKING INDUSTRY IN THE STATE OF LOUISIANA

In accordance with the request of the Senate's Committee on National Water Resources that information be presented before it at a field hearing in Louisiana relative to present and future needs for water, the seven corporations that operate in Louisiana for the production of paper have cooperated to the extent of pooling their data and opinions and wish to submit the following report:

Water needs by the paper industry of Louisiana

	Gallons per day
Water presently used:	
Surface water	80, 900, 000
Well water	70, 200, 000
Total	151, 100, 000
Additional needs by 1965 (wells)	50, 000, 000
Total	201, 100, 000
Estimated needs by 1980:	
Surface water	185, 000, 000
Well water	254, 000, 000
Total	439, 000, 000

A comparative table for the conversion of units

	Gallons per day	Cubic feet per day	Acre-feet per day	Acre-feet per year (360 days)
Present:	*Millions*	*Millions*		
Surface	80.9	10.8	248.4	89,624
Wells	70.2	9.4	215.5	77,580
By 1980:				
Surface	185.0	24.8	568.0	204,480
Wells	254.0	34.0	780.0	280,000

Production of paper is a major industry in Louisiana; 10,030 people are directly employed in the papermills; 3,373 people are employed in converter plants which produce paper containers.

In addition, approximately 6,000 men are required in the woods in procuring and transporting pulpwood to the mills. These individuals are independent operators and are not paper company employees.

The above figures, totaling nearly 20,000 persons, do not include the large number of individuals who have employment because of the existence of the paper-producing industry in the State, such as, the people employed in those industries that are users of paper as a major raw material, and the people engaged in transportation, jobbing, sales, and advertising of paper and paper products.

Obviously, it is difficult to anticipate with any certainty the needs for water for the 20-year period. This is particularly true for the paper industry due to uncertainty as to the percentage of paper products that will have to be bleached. The bleaching operation requires considerably more water. The industry is constantly making improvements in manufacturing processes and in methods for reusing water. In the last 10 years, the amount of intake water per ton of pulp produced has been reduced to about half of the quantity of water previously required.

[1] The 1957 Annual Report of the National Council for Steam Improvement (of the Pulp, Paper, and Paperboard Industries), Inc., has been placed in the committee files.

It is estimated that the demand for pulp, paper, and paperboard by 1980 will require the production of these items to be doubled between now and 1980. It is expected that the mills in Louisiana will equal or surpass the national average. It is on this basis that we have predicted the needs for water by 1980. It will be noted that the anticipated use of well water is proportionately much greater than the increased use of surface water. It may well be, however, that the underground water supplies available by 1980 may not be adequate for this great demand. If the paper industry is to expand, the additional water needed will have to be made available. Surface supplies might be created both by making water available to the companies for storage in their own reservoirs and by maintaining an adequate supply of flowing water in the streams by appropriate means.

The maintenance of adequate minimum flow rates in the streams on which individuals depend for their water supply necessitates some definite regulation relative to the minimum flow rates from any reservoirs upstream. It is the definite and unanimous opinion of the representatives of the paper industries of Louisiana that any law written in the future to create a reservoir should definitely specify the minimum flow rate that will be maintained from such reservoir. It may not be possible to enforce such requirements for existing reservoirs, but anything that can be done to encourage the maintenance of minimum flow rates would be very advantageous to industrial operations downstream. Although some benefit has been noted on the Ouachita River during low-flow periods due to recently completed impoundments in Arkansas, only one dam is required by contract to maintain a minimum flow rate. This is from a private lake. It is believed that minimum flow rates could be established for certain of the other impoundments which would be of great help to downstream users without really adverse effects on anyone.

It is essential that an adequate water supply be available not only for process water but also to serve as dilution water for the mill's effluent.

In addition to having an adequate quantity of water available, it is important that there be improvement in the quality of water that is available from the streams. Whereas other components of the natural waters are important, the two that can be most readily and effectively improved are the suspended solids and the excessive salt content. The creation of large reservoirs upstream on the Red River have markedly improved the quality of the water in Red River in at least two respects. Suspended soil particles tend to settle out in the impounding basins, thus clarifying the water before it passes down the stream. Also these large reservoirs have tended to equalize the salt content of the water by diluting salty water with more surface water before the water leaves the reservoir.

From the standpoint of the general economy of natural resources, it should be pointed out that the papermaking industry uses renewable natural resources rather than depleting Mother Nature's store of resources that have been produced during geologic time. In Louisiana the tonnage of wood cut for industrial uses is less than the growth rate of the trees.

Production of paper from bagasse is an industrial operation in Louisiana, and as long as sugarcane is grown in the State, the raw material for paper will be an annual crop.

Aside from the cellulosic raw material, the major need of the paper manufacturer is for an adequate supply of suitable water for processing purposes. Whereas the paper industry is a very large user of water, it is not a major consumer of water. At least 90 percent of the water that is taken into a paper mill for use is returned to surface streams and is available for use downstream. The paper industry is very conservation minded about water and is constantly striving to find more ways to reuse water within the mill so as to make the same water serve double or triple duty before it rejoins the streams. Approximately three-quarters of all water taken in by the pulp and paper industry is being recirculated as compared with the rest of the Nation's industry which only recirculates about half of its water.

It is pertinent to point out that the trees growing on land owned by the paper industry serve a very important role in maintaining the hydrologic and hydrographic cycles of nature. It is very probable that these company-owned lands make more water available for man's use than the quantity of water that is used by these companies.

Representatives of the paper industry are firmly convinced that the control of water supplies and the problems related to water usage should be left to the

individual States or should be regulated by mutually agreed upon interstate compacts. Such arrangements are preferred as compared to Federal control since it is believed that local and regional problems will be better understood by local and regional people.

Companies representing the paper industries of Louisiana appreciate the opportunity of presenting the information contained in this report together with comments which reflect their considered opinions as to some of the factors involved in securing and maintaining adequate water resources.

Recognizing the needs of the industry for clean water and the needs and problems presented by waste disposal, approximately 15 years ago the pulp and paper industry sponsored the National Council for Stream Improvement of the Pulp, Paper, and Paperboard Industries, Inc., with offices at 271 Madison Avenue, New York, N.Y.

The council has conducted and is now conducting extensive research and experiments on the various problems which have been of considerable help to the industry.

Copies of the 1958 annual report of the national council are filed herewith.

WATER AND THE FUTURE OF THE PAPER AND PULP INDUSTRY

(By John G. Strange, president, the Institute of Paper Chemistry)

When I was invited to speak to this assembly on "Water and the Future of the Pulp and Paper Industry," I accepted with some reluctance because it seemed to me that the subject was essentially a technical one and that there were many who were better qualified to deal with it.

Meanwhile I have read scores of papers, reports, and books on water and have talked with quite a few who have been active in the field. In a sense I have had "water on the brain" for the past several weeks, and although I am still certain that there are many others who could speak with more authority, I no longer believe that water is primarily a technical or professional problem. As a matter of fact, the technical aspects are relatively straightforward. The real problems are those which involve policy, principle, concept, and equity, and as such they are problems which should be high, if not first, on the agenda of management—and especially the management of this industry.

I am persuaded that the pulp and paper industry is doing a relatively good job on the technical phases of water but that we have not participated in a sufficiently active or adequate manner in the countrywide discussions and debates on the broad sociological, economic, and political issues of water use and water conservation. We have, in short, been either too silent or too defensive in our position. This is distressing for at least two reasons; first, because water is absolutely critical to our industry welfare, and, second, because we are in an unusual, if not unique, position to contribute to the formulation of sound policies.

This is the essence of what I would like to say today. Before I can elaborate, however, it appears necessary to review briefly the general water situation.

In a very broad sense, the amount of water in our world is a stable quantity. We can change its position and availability in given locations, and we can affect its form and quality temporarily, but there is nothing that we can do to expand or decrease the total supply. For millions of years there has been a steady circulation of water from the earth's mantle into the atmosphere and back again, and there is every reason to expect that this rotation will continue for eons in the future. This eternal interplay of vapor and water is known as the hydrologic cycle, and although we may tamper with this cycle and change its manifestations and effects within given geographies, the universal factors are immutable. It is this proposition of a constant and discernible supply that distinguishes water from all our other resources.

It is generally agreed that we have an average rainfall or precipitation of approximately 30 inches per year in the United States. This will vary from a few inches in the arid regions to as much as 160 inches in the Olympic Peninsula. Sticking to average figures, however, it is further agreed that approximately 70 percent, or 23 inches of the precipitation goes rather promptly back into the atmosphere through evaporation and transpiration, or the breathing of moisture from vegetation. The remaining 8 or 9 inches either finds its way into streams and ultimately runs into the oceans, or it soaks into the ground to feed the vast reservoirs which are constantly percolating and moving under our feet. Our

supply of water for agricultural, industrial and municipal purposes comes principally from this 8 or 9 inches which amounts to roughly 1,200 billion gallons per day, or about six times the volume of water we are presently using.

Unfortunately, however, this generalized picture tends to bury in the shallow grave of averages the fact that water is in critically short supply in certain parts of the country and that additional shortages faces us in many other localities, including those which have historically enjoyed surpluses. These shortages are caused, in part, by the pressures of expanding population, by the growing needs of industry, and by modern agriculture's increasing use of irrigation. They are aggravated by the fact that we have molested the hydrologic cycle in many regions through short-sighted municipal, industrial and agricultural practices and by the further fact that the quality of our supply has suffered because of pollution and siltage.

Most authorities agree that our national requirements for water will nearly double within the next 20 years. They predict that we shall use more water for all purposes but that industry's needs will grow proportionately faster and that whereas industry now is responsible for some 40-odd percent of the total use pattern, it will account for 60 percent in 1975.

In a word, water is our most broadly used resource; it is vital to all segments of our economy; it is in short supply in many areas and will become so in many other areas; there will not be enough for unbridled use by all who seek it; and it is thus becoming increasingly urgent that we improve the position and quality of the supply and the legal and administrative mechanisms for allocating its use. These facts and these needs constitute our national "water problem."

Where does the pulp and paper industry stand in this general picture? From a quantitative standpoint it can be said that we are the third largest industrial user of water, surpassed only by the primary metals industries and the chemical industry. Both of these industries use considerably more than we do. Together they account for more than 53 percent of the total industrial withdrawal of water, whereas the pulp and paper industry represents a little over 13 percent of the total. This is only part of the story, however, because the paper industry uses more process water than any other industry, and it also treats a higher percentage of its intake. It can be said, therefore, that we are more critically dependent on water, and especially high quality water, than most industries. This dependency has had a more restrictive influence on the location of new plants than has any other economic or raw material factor.

As one contemplates the water situation, particularly within given areas, he often finds it necessary to distinguish between those who "consume" water and those who merely "use" it. Water is never consumed in the ultimate sense, of course, but from a hydrologic standpoint it is regarded as having been consumed when it is sent back to the atmosphere rather than released to the stream or into the ground where the others may use it. Within this context, it is quite obvious that agriculture is the largest consumer of water and that industry actually consumes very little. Estimates have been made that anywhere from 40 to 80 percent of the water used in irrigation is "consumed" against an average of less than 10 percent on the part of industry. From another perspective, it may be said that over 90 percent of the water taken in by industry is discharged for reuse by other consumers or by nature. And this raises, of course, the highly important question of the condition or quality of the released water.

Before dealing with this subject, however, it is relevant to ask how much water industry itself reuses or recycles. Five industry categories are responsible for over 85 percent of the water taken in by all industries. It has been estimated that if these particular industries did not reuse or recirculate any of their intake, they would require roughly twice as much water as they are now using. The paper industry stands second from the top in its reuse factor, an achievement which is particularly noteworthy when we recall that most of our water is used for process purposes.

Returning now to the condition and quality of discharged water, we are faced with at least three considerations. There is the hazard, if any, to public health; there is the proposition of the suitability and cost of such water to subsequent users, and there is the question of its effect on wildlife and recreation.

It is obvious that any use of water diminishes its quality in some way or other. As a matter of fact, water is probably "pure" in the absolute sense for only a few fleeting moments after the sun has drawn it from the earth in vapor phase. Thereafter, it is changed or adulterated in many ways. It may be changed by nature, or it may be changed by human manipulation, but in any event it is inevitably changed from its pristine form.

I make this point because we sometimes hear that water should be restored to the streams in a condition of "pristine purity." Actually this is a status which is possible only for nascent water, and, if we may use a metaphor, the water which we encounter, whether it be in the remote wilderness or in populated areas, is "adult water." The issue, therefore, is not whether discharged water is actually pure in a scientific sense but rather one of whether it contains impurities that are a hazard or an undue liability to those who may subsequently use or inhabit its flowage.

Certainly the first consideration is that of public health. I am sure that everyone would agree that discharges which actively threaten health should not be tolerated. Generally speaking, industry has long since taken care of this side of the problem. It is said, however, that the sewage of nearly 30 million people is still flushed into the rivers without treatment.

The question of the suitability of discharged waters for use by others is a most complex one. It is difficult to pinpoint technically; it raises involved problems of equity, and often severely strains the relationships between industrial neighbors. The headlines of today are primarily concerned with the effects of discharged water on health, wildlife, and recreation and therefore lead the public to think that industry is in a vis-a-vis position with the balance of society on these matters. Actually, this is far from true, and as we look into the future it would appear that the necessity of obtaining the optimum use of our water supply will focus attention increasingly on the relationships between industrial plants on the same bodies of water and their respective responsibilities with regard to the treatment of both intake and discharged water. The problem, in other words, will become more and more one of industry vis-a-vis itself rather than the other elements of the economy.

The influence of industrial discharges, or any kind of pollution, upon wildlife and recreation is a subject that stirs emotions. It lends itself to righteous indignation and poetic expression, a formidable combination. And a combination, incidentally, which can lead to extreme positions. I am not trying to be sarcastic, nor am I depreciating the importance of the wilderness and recreational measures. They have a very genuine validity and a universal appeal.

As our population grows, and as we spread ourselves and our artifacts more extensively throughout the land, the areas of refuge from carbon monoxide and civic congestion will become more remote and proportionately less capacious. I am sure that even the most confirmed urbanite would agree that we should aim at the highest level of "good housekeeping" insofar as the contiguous streams and recreational facilities are concerned and that we should also maintain the integrity of the larger and more distant preserves. Even though one may not take advantage of these facilities, the very fact that they do exist gives ethical and spiritual satisfaction and becomes a symbol of potential release from the pressure and tensions of modern living.

In our enthusiasm for this cause, however, we should not impose measures and restrictions on agriculture and industry which are more severe than nature ordinarily imposes on herself. Neither should we overlook the fact that technical know-how does not yet exist for the reasonable solution of some of the more complex industrial and municipal disposal problems. Our efforts to improve the compatibility of nature with the effects of an urbanized, industrial society should, therefore, proceed in accordance with programs which will encourage and, indeed, stimulate progress but which will not exceed present technical feasibility or unduly jeojardize the competitive status of those involved.

It seems to me that, on the whole, the paper industry has been doing a rather outstanding job on stream improvement. Through agencies such as the National Council for Stream Improvement, Inc., the Sulphite Pulp Manufacturers' Research League, the University of Washington, and the newer group organizations on the west coast and in the South it has pooled information and achieved many technical advancements. At the Institute of Paper Chemistry we have done quite a bit of fundamental research on relevant matters and have made field surveys of most of the streams and bodies of water supporting pulp and paper companies. If we add individual company efforts to the various group enterprises, this industry has spent many millions of dollars to improve its discharged water. One measure of our progress is the fact that the pollution load of the average ton of production has been reduced by 50 percent in the past 15 years.

Turning now from this abbreviated review of the supply and consumption of water, we come to the very complicated and controversial questions of what is to be done about the situation, who is to do it, and how should it be done. These

are not new questions. Actually, as the observations of Thales, Plato and Pliny the Elder remind us, they have been a primary concern of most civilizations and have had a profound influence on the shaping of social, political and religious institutions.

One very capable historian recently published an exhaustive study of oriental despotism. In his judgment, the comprehensive tyranny which has flourished in that part of the world since time immemorial may be attributed to the central control and management of water. He refers to these governments as "hydraulic societies." To quote his words: "The constructional, organizational, and acquisitive activities of hydraulic society tend to concentrate all authority in a directing center: the central government, and ultimately the head of this government, the ruler." [1]

Although the issues and problems of water management and distribution are as old as recorded history, we are presently striving to deal with them through the mechanisms of a federalized, competitive society and within the relatively new context of a highly industralized, dynamic economy. Our efforts, it would appear, fall into the two broad categories of formulation, where we are concerned with the development of a rational system of ownership, management and usage, and alleviation, where we are concerned with improving the position, quality and availability of our supply. Obviously the two categories interlock in many ways.

The extent and urgency of our concern with these problems is indicated by the fact that nearly all of the States have appointed commissions or committees to review the subject. It is emphasized by the fact that within the past 8 years there have been four major studies within the executive branch of the Federal Government. And it is further disclosed to anyone who will take the time to read the transcripts of the many regional and national conferences and symposia which have been held by various private and public organizations.

Looking first at the broad category of formulation, we find that this frequently involves property rights and that it is thus of particular concern to the State governments. As we examine the circumstances within and among States we see a most confusing arrangement of administrative, statutory and common law. On the one hand there is the so-called riparian doctrine, and on the other, there is the doctrine of prior appropriation. And in between these two extremes are so many modifications, exceptions and combinations that the layman becomes quite bewildered. One suspects that this is frequently true of the lawyer also.

There is no question but what our water laws require revision and codification. It is important to recognize, however, that these substantially technical steps cannot be isolated from the more fundamental, nonlegal issues of how our water resources should be used and managed. And the resolution of these issues in turn involves the assembly of more hydrologic and economic data than we now possess. This is why many people feel that current efforts to draft a model State law are premature. If we push too fast in this direction there is danger that we may wind up in one of two extreme positions. Either we may adopt measures which are so restrictive that they will both violate existing equities and hinder new developments, or, aiming at flexibility, we may leave too much to the discretion of administrative commissions.

The development and control of our water resources has been a major concern of the National Government for many years. There are more than 40 different Federal agencies dealing either directly or in some degree with the subject. It should surprise no one that in many instances there are overlapping and competitive viewpoints among these groups. Thus far at least $17 billion have been spent on Federal water projects, and an amount equivalent to this has already been authorized for new programs. Beyond this, there are studies and proposals which seem to call for an adidtional $60 billion within the next 20 years or so. Non-Federal and private sources have already invested around $65 billion in water development, and one observer has calculated that the intermediate future may call for another $280 billion, assuming that the present ratio of Federal and non-Federal outlays holds fast. Apparently our use and manipulation of water is not going to come cheaply.

It seems to me, however, that we must do more than merely extrapolate our present needs and programs. If we stop at this point, we are passively assuming that all of the basic policies have been settled, that we are already

[1] P. 90, "Oriental Despotism: A Comparative Study of Total Power," Karl A. Wittfogel; Yale University Press, 1957.

on the most effective and efficient course, and that the primary problem is one of ways and means. These would be tragic assumptions because there is rather good evidence that the job need not be quite as formidable or as expensive as some people would have us believe.

With this in mind let us consider for a moment the second broad category of our water efforts, namely, alleviation, or the improvement of the quality and availability of our supply. Here, as in the category of formulation, we find considerable controversy and confusion.

There are, first of all, the competitive and contradictory programs of various local, State, and Federal agencies which arise out of parochial or restricted concerns with drainage, land reclamation, fish and wildlife management, recreation, stream improvement, flood control, and the like. In the main, however, the controversy in these areas is relatively petty in comparison with the more fundamental conflict between those who would emphasize upstream measures and projects and those who are convinced that first attention should be given to the construction of downstream reservoirs and dams.

Now it is manifest that water pays little attention to local, State, or even national boundaries as it gathers itself into brooks, streams, and ultimately large rivers. There are probably 10 or 12 major river basins in this country. They are related to the water supply of at least 41 States and are generally regarded as the logical subdivisions for developing a cohesive national water resources program. These great basins, in turn, are comprised of many separate watersheds, some of them lying entirely within local or State limits and others embracing still larger territories. The watersheds may be viewed as the planning units or building blocks within the more comprehensive structure of the major river basins.

If one were to draw a hydrographic map of the United States using the major river basins and their constituent watersheds as contours, it would have little in common with existing political boundaries or agencies. This is why the concept of river basin commissions and interstate committees to coordinate the larger hydraulic programs has such wide appeal. There are many, however, who fear that if we concede too much authority to these administrative bodies they may extend their coordinative responsibilities to the control of matters which are primarily of local concern. Here, as in so many issues of the day, we are confronted with the basic question of whether the primary political and financial initiative should come from the bottom upward or the top downward.

Generally speaking, those who would like to see private enterprise and local governments do the lion's share of the job focus their attention on watershed development and tandem upstream dams, whereas the advocates of Federal action stress the building of huge multipurpose dams which would generate power, control floods, and contribute to large-scale irrigation projects. Because of their size, these structures would have to be located principally on downstream sites. One perceives that the multipurpose school of thought includes social as well as hydraulic engineers.

If we eliminate the emotional, social, and political overtones in our consideration of water management, several facts emerge. In the first place, water falls on countless and farflung watersheds. Our initial responsibility is to see that these watersheds are as efficient as possible in their collection and conservation of moisture. Second, the flowage from these watersheds congregates in smaller rivers, streams, and lakes. Here we have an opportunity to marshal and regulate the supply, making it available for agricultural, industrial, and municipal purposes and developing power, if the economics are feasible. Finally, the smaller bodies of water merge into the great river basins. At this point we become more concerned with navigation, the storage and diversion of large quantities of water for agricultural and metropolitan use, the development of major power projects, and the coordination of flood control. The sequence, it should be observed, is from the fountainhead, or primary sources, to the ultimate confluence, with maximum utilization all along the way.

Those who would give priority to upstream measures do not reject the need for strategically located, large multipurpose dams. They contend, however, that we should tackle the water management job sequentially and that there are several important advantages in going about it in this way. First, it is more efficient because proper recognition is given to the small watershed as the fundamental unit in water conservation. Second, it is more democratic because the surrounding communities must display initiative and assume responsibility. Third, it is less expensive because the costs are shared along the line, and the

final projects are therefore less massive. Fourth, it is more flexible because it does not commit an entire river basin in one grand gesture to a relatively fixed use pattern. And fifth, it is the most effective and equitable way of determining the need and location of the large multipurpose dams of the future.

The President's Water Resources Policy Commission is often cited in favor of multipurpose projects. It is pertinent, therefore, that we should recall the following sentences from their report. "Once they are completed, major water control structures can be altered only with difficulty, or not at all. * * * There is a sobering finality in the construction of a river basin development; and it behooves us to be sure we are right before we go ahead."

In my opening remarks I made the statement that the paper industry is in an unusual if not unique position to contribute to the evolution of sound policies for the development and management of water. As a large and important user of water we have, of course, a compelling and legitimate interest in the subject. In this respect, however, we are not very much different from any other segments of the economy. As an industry which is frequently located on upstream sites, we are in a position to assist in measures which will conserve and improve the supply for downstream consumers. But there are quite a few others who have the same opportunities and responsibilities. As an industry which is concerning itself in a conscientious and vigorous manner with the job of stream improvement, there is no need for us to be on the defensive on this score. But there are others who are making equally commendable efforts. When we examine the paper industry as a manager of land and a steward of the forests, however, it assumes a position which is unique among those who have a large appetite for water.

It is both elementary and axiomatic that the future of the paper industry is dependent upon the continuous and expanding development of our Nation's woodlands. The tremendous capital requirements of this industry dictate the fact that we cannot approach the forests on a "suitcase" basis. Obviously, we must play the role of the husband, or the steward, and modern management is thinking and planning in terms of generations rather than merely in terms of today or tomorrow. This is the philosophy with which we approach our fiber resources, and it is the philosophy which we have been trying to spread wherever people will listen.

Now the vital relationship of forests and their management to water and watershed development is patent to anyone. Therefore, our first claim to distinction is that we are a part and parcel of the most important single approach to the solution of our country's water problem, namely, the intelligent handling of watersheds. As a major participant in this activity it is incumbent upon us to express our views and to ascertain that other approaches to the supply and distribution of water do not violate this basic regional foundation.

Our second claim to distinction is a corollary of the first. This industry owns and operates approximately 47,000 square miles of forest land. If one computes the average runoff from these lands he finds that it amounts to more than seven times the volume of water which this industry uses or withdraws in its manufacturing operations. Our role as a supplier of water is thus much more significant than our role as a user of water, and we take our position at the public water trough not so much as a seeker but more as a provider.

In view of these circumstances, it seems to me that the paper industry is particularly qualified, both ethically and functionally, to play a prominent part in the many discussions and studies of this country's water problem. I would suggest that we do so in a concerted way by contributing to the factual and technical information which is so badly needed and by expressing our views on the legal, social, and economic issues which override all other considerations in their importance. If we fail to take these steps we may find that we have not assured an adequate supply for our own future, and we shall also have forsaken a very real opportunity to advance the general welfare.

Mr. WIMBERLY. Now, Mr. Chairman, we would like to pass to the matter of pollution and I would like to call Mr. Kenneth Biglane, executive secretary of the Stream Control Commission, State of Louisiana.

STATEMENT OF KENNETH E. BIGLANE, EXECUTIVE SECRETARY, STREAM CONTROL COMMISSION, STATE OF LOUISIANA

Mr. BIGLANE. Mr. Chairman and members of the committee, my name is K. E. Biglane. I am executive secretary of the Louisiana Stream Control Commission. I also have a dual role in that I serve as chief of the Division of Water Pollution Control of the Louisiana Wildlife and Fisheries Commission.

Before I go into my paper I would like to commend this committee, if I may. I have been reading the papers this morning. I would like to make the observation that you certainly appear interested and you certainly are knowledgeable.

Mr. Chairman, and members of the committee, I have been directed to prepare a statement for your honorable group on behalf of the Louisiana Stream Control Commission on the subject of water resource views and utilization, past, present, and future, as are interpreted by the above-named State agency. As a result of the very short notice given to me in order to prepare such an important declaration, I will endeavor to highlight those topics which we believe to be essential for the protection and maintenance of our fresh water supplies. In general, I am going to try to develop for you—

1. The manner in which the State water quality control authority has functioned and is presently functioning.

2. The assistance received from and given to Federal agencies in the pursuit of our endeavors.

3. Some anticipation of State water needs and uses for the future.

These three points will be protected as per your recommendations that information be related to the national interest and helpful in considering water resource policies for the future.

During the course of this hearing you will undoubtedly hear some statistics pointing out that Louisiana has a fresh water supply which far exceeds that of any similar areas in the United States. Without repeating these impressive figures, I want to call to your attention that rainfall and surface waters are not evenly distributed with respect to time and geography.

The largest fresh water source in the State, the Mississippi River, has been reported to contribute 84 percent of the total average daily flow of all streams in the State.

Laws relating to water resources in Louisiana are embodied in (1) the State's constitution, civil code, revised statutes, and reported supreme and appellate court decisions, (2) certain special or local laws enacted by the State legislature that have not been incorporated in the revised statutes, (3) Federal statutes, constitutional provisions, and court decisions, (4) certain rules and regulations promulgated by State and Federal agencies, (5) certain interstate compacts or agreements, and (6) local court decisions not appealed from. The Louisiana Stream Control Commission is, by State legislative action, the water quality authority for the State.

The Louisiana Stream Control Commission is an ex officio board and is composed of representatives from the State board of health, the department of conservation (which governs minerals and ground waters), the attorney general, the department of agriculture and im-

migration, the department of commerce and industry, and the wildlife and fisheries commission. This commission's primary function is to upgrade the quality of affected surface waters of the State and to maintain all surface waters so as to protect the public health, the public welfare, fish or other aquatic life, and wild or domestic animals or fowls.

From the description of this commission and its primary functions, Mr. Chairman, you can readily see that from a water quality standpoint all surface waters in this State are protected for multipurpose uses.

There has been increased concern over water pollution expressed on both a National and State level since World War II, but especially during the past 9 years. Public awareness of this problem has demanded that action be taken on those surface waters which had been allowed to become downgraded because of increased volumes of wastes coming from the tremendous industrial expansion during the war effort, the lack of technology of control over many of these complex effluents, the physical alteration of waterways which influenced normal streamflows, wastage from increased production of oil, gas, salt, sulfur, gravel, sand, and other minerals, the complete blocking of many of our navigable streams and impoundments by obnoxious botanical growths, pollution of important interstate rivers and drainage basins, and a general reluctance on the part of many citizens who feared that industry would move away from their community or shut down entirely if pollution laws were caused to be enforced.

Prior to 1950, Mr. Chairman, these problems seemed insurmountable. Shortly after this time the State saw fit to increase its water pollution control field and laboratory staff. Biologists, engineers, bacteriologists, and chemists were employed. Some of these personnel were afforded valuable training in team data gathering and water basin survey techniques at the Robert A. Taft Sanitary Engineering Center, a U.S. Public Health Service and research organization in Cincinnati, Ohio. After much valuable information from our surface waterways was obtained, the stream control commission acted to accomplish the following:

Drafted and promulgated regulations requiring the submission of chemical and engineering data relative to the discharge of industrial wastes from new industry and from existing industries that desire to expand their facilities. From this data the commission determines whether or not the discharge will be harmful to surface water and rules accordingly.

From January 1956 to November 1957, the commission ruled on 32 such cases, the most active biennium of record. From January 1958 to the present, the commission has heard nearly 30 cases, with one meeting remaining before the end of the year.

I cite these records to indicate that a high level of industrial activity is still being maintained and that more and more demands will probably be placed on our watersheds.

The commisison revised and promulgated regulations governing the disposal of oilfield wastes and all other materials resulting from the drilling, production, and transportation of oil, gas, and sulfur.

Oil well drilling wastes constitutes one of the most serious problems in the State. A report by the department of conservation revealed

that in August 1956, 53,715,395 barrels per month of brine was produced from pumping activities. Of this amount, nearly 17 million barrels per month ended up in our surface waters. The bulk of this brine comes from overproduced oilfields—overproduced in the sense that when the fields were first founded, production proceeded at a furious pace. At that time there were no laws pertaining to allowable production and no laws spacing the holes. When laws were enacted to conserve this resource, these fields had already become designated as "stripper fields." This simply means that the producer pumps all the liquid he can and recovers what little oil there is. At the present time, you gentlemen are seated within 50 miles of one of the largest stripper fields in the oil-producing States. Some 176,000 barrels per day of brine are pumped and only about 2,000 barrels per day of oil are recovered. This brine finds its way into a 70-mile long river which courses through thousands of acres of prime fishing, upland game, and migratory waterfowl areas. Enforcement efforts by the State on this specific case have, over a two-decade period, apparently been unsuccessful. Here, gentlemen, is one type of those issues that certainly must plague water pollution control administrators in many other States across the Nation. From my standpoint, it is a problem of enforcement and an attempt to be consistent with policy. From the standpoint of the citizen living in one of the several small communities in and around this stripper area and depending to a large extent on the payroll dollars from this waning oilfield, it is a problem of pure economics.

There are a number of untried approaches to such a problem; the introduction of new industry into the area, State directed, and participation in unitizing, to name two. However, it is a State problem and a solution has to be found. Nonetheless, it is one of those type problems that prompted the Honorable John D. Dingell, U.S. Representative from Michigan, to author H.R. 8494, 86th Congress.

This bill sought to strengthen the Federal Water Pollution Control Act of 1956 by providing for Federal enforcement of water pollution on all navigable waters in the United States.

Now the courts of Louisiana have ruled that "a stream is navigable in law when it is navigable in fact." Discounting this, I am unequivocally against any more Federal regulation on waterways in this State. If we, as a State, cannot assume the responsibility of maintaining the quality of all our waters, then our present level of prosperity will be a stagnate level in 1980.

While on the subject of the Federal Water Pollution Control Act of 1956, Public Law 660, permit me to state that in my opinion this legislation ranks high as being one of the most widely beneficial our Federal Government has ever passed. Section 6 of this act, that which provides for grants on a matching basis to municipalities for sewage treatment, will undoubtedly be discussed by Mr. John Trygg, State board of health.

Section 5, that which provides grants for water pollution control programs, has been extremely helpful to my division in helping to increase our State appropriation, expand our field surveys and laboratory facilities, recruit and maintain the professional staff, enhance the administration of the construction grant program, and to promote better direct law enforcement activities. Our relations with the dis-

trict VII, Public Health regional office in Dallas, have been most rewarding and our commendation goes to these Federal employees who have graciously given their time and consultation regarding Public Law 660, the Red River compact, interstate enforcement activities, and other facets of Federal-State business regarding water quality and quantity.

The enforcement provisions of this act as it amended Public Law 845 were utilized by Louisiana in the first interstate proceedings ever to be conducted by the Federal Government. As a Board member appointed by the U.S. Secretary of Health, Education, and Welfare, to this precedential move, I had the privilege of studying this law in action and to observe the postaction attitudes of the offending State in this hearing. I have concluded that so long as this law remains active, then there is a strong motivation for upstream States to keep their water pollution control authority in a workable and well-staffed condition. This is as it should be and, ultimately, this will be the answer to many of our local problems.

Without going into specifics I will end this section by stating that the commission has been extremely successful, by regulation, enforcement, and persuasion, in clearing many miles of surface water contaminated by municipal sewage, papermills, oilfields, sulfur miners, sand and gravel miners, food canners, fish processors, poultry processors, petrochemical manufacturers, oil refiners, basic metal refiners, slaughterhouses, and naval stores plants. The State is presently involved in a court action with a papermill.

In commenting on the water needs of this State for the next 20 years, I call your attention to a previous statement that although Louisiana is considered a water-rich State, her surface waters are not evenly distributed with respect to time and geography. For this reason there are some basins in the State that need more water than is now present during low flow periods. Bayou Teche, the Vermilion River, and Bayou Lafourche (lower coast) are three that are immediately brought to mind. These particular streams and others like them do not have enough normal positive flow to even assimilate natural organic loads. The Teche and Vermilion flow through rich agricultural areas and their banks are dotted with large and small communities. The Teche flows near numerous sugar mills which discharge large quantities of condenser water wastes.

Through research and from enforcement, these mills have reduced their waste components to about as far as the present known existing technology of control. The Vermilion receives the treated discharges from food canners, sewage plants, slaughterhouses, and rendering plants. Here again is the same situation: the industries have done about all that is presently known to do but there is just not enough water to assure normal assimilation. It is safe to assume that you gentlemen have heard in the course of your readings and travel that probably the second most important use of water today is to carry away wastes. This infers that dilution is essential for today's complete abatement of pollution.

In order to satisfy the abatement needs of these watersheds, then more water will have to be diverted to them. In order to effectively distribute waters from other basins to these areas, Louisiana must be assured of receiving water of acceptable quality from upstream States

and must have a voice in any project that may tend to significantly decrease the minimum flows in these interstate basins.

The Sabine River compact between Texas and Louisiana and the Red River compact (in the formative stages) between Texas, Arkansas, Louisiana, and Oklahoma, can, and have, provided a means of declaration.

As a general rule public works projects to divert water for flood control, to provide reservoirs, or any other technique to physically control quantities of water are expensive. After reading the reports of the Mississippi River Commission, I am convinced that no one State could afford the magnanimity of costs that these projects require. It is, therefore, safe to assume that the Federal Government will continue to be asked to help with project expenses.

Up to the present time the stream control commission has not had the staff to adequately study many of these completed or proposed projects with their view of maintaining water quality.

While I understand that the provisions of title III of Public Law 500, 85th Congress, carriers a U.S. Public Health Service and U.S. Fish and Wildlife Service recommendation on such actions to that agency of the Government empowered to construct these projects, I am in favor of as much State control of these projects, once finished, as is possible.

In closing, I wish to convey to you my impression that this State and this Nation is becoming awakened more than ever before to the value of plentiful supplies of fresh water. Most States have one or more real vexing water pollution problems and can look forward to many more problems if researches on the waste treatment of complex organic substances, the furtherment of existing treatment processes, and the treatment and disposal of radioactive compounds are not significantly increased. Although research on these and similar waste problems stand out as the greatest factor in solving these entities, and enforcement has its place toward the ultimate elimination, I am convinced that in Louisiana a program of watershed control and management implemented with the views and recommendations of all interest groups will assure our State of plentiful supplies of fresh water for all legitimate uses. Such programs are successful only with the support of an informed and understanding public. The presence of this committee here today is fulfilling part of this motivation, and since you gentlemen have undertaken this tremendous task for the Nation, I wish you well.

Thank you very much.

Senator ELLENDER. Thank you very much, sir.

Any questions?

Senator HART. Mr. Chairman, the witness made comment about a colleague of mine in the Michigan delegation, John Dingell.

Mr. BIGLANE. Yes, sir.

Senator HART. While I am not familiar with the detail of his bill, 8494, I would just like to ask this. You indicate that for two decades enforcement efforts by the State on this particular case you describe and that was the waste out of oil pumping——

Mr. BIGLANE. Yes, sir.

Senator HART. Have been apparently unsuccessful.

Mr. BIGLANE. Yes, sir.

Senator HART. You say that if the State does not maintain the quality of its water its economic level will become stagnant by 1980.

Mr. BIGLANE. Yes, sir.

Senator HART. Now if a State wants to have that as its economic level by 1980, that is fine. But let us assume that this pumpage of waste and failure effectively at the State level to eliminate it affected another or several other States who might not want their economic level to be stagnant by 1980, do you feel that this bill is the only means whereby those States could find protection?

Mr. BIGLANE. Sir, I don't know how other States feel but in Louisiana we will find a solution to this problem. It has taken time for the attitudes of pollution control to get where they are today. This is evidenced nationwide as this committee will attest to. Up to the present time, I might add that in this case about the only immediate damage it is doing is affecting the wildlife interest.

Now for many years wildlife interests have taken second seat to the problems of pollution control. Conservation has become a series of compromises, it has been my observation to note.

I am confident that with the increased tempo and attitudes of pollution control that answer will be found in this basin.

I have stated my position is one of enforcement. I am confident that my State legislature will see fit to give me those tools with which to enforce this.

Senator HART. The introduction of the bill such as Congressman Dingell put in should give you added ammunition to impress on the State legislature the necessity of implementing your enforcement staff.

Mr. BIGLANE. Yes, sir.

Senator HART. In order that the pressures will not build up to have some Federal action.

Mr. BIGLANE. Yes, sir. I found in this State that if I more or less threatened people with Federal action that cooperation thereafter comes a little bit slower.

Senator HART. Slower?

Mr. BIGLANE. Yes, sir.

Senator HART. Even when the subject matter is only wildlife?

Mr. BIGLANE. Yes, sir. As I stated, up to now wildlife has taken second seat in many areas of the State.

Senator HART. Thank you.

Mr. BIGLANE. With your permission, gentlemen, I would like to introduce Mr. Leo W. Hough, who is the State geologist and he will have certain comments relative to ground water in the State.

Senator ELLENDER. All right, Mr. Hough. Proceed.

Mr. HOUGH. Sir?

Senator ELLENDER. You may proceed.

STATEMENT OF LEO W. HOUGH, STATE GEOLOGIST, DEPARTMENT OF CONSERVATION, STATE OF LOUISIANA

Mr. HOUGH. Mr. Chairman, members of the committee, my name is Leo W. Hough. I am State geologist for Louisiana. I represent the Louisiana Department of Conservation and the Louisiana Geological Survey.

The State department of conservation in Louisiana regulates the oil and gas industry in the State to prevent waste. In connection with this regulation it has the responsibility of protecting our underground fresh water strata from contamination by the intrusion of oil, gas, or salt water from wells drilled in search of oil, gas, sulfur, salt, and other minerals.

Conservation department rules and regulations and adequate inspection during drilling and completion insure this protection. In 1958 permits were issued for the drilling of 4,526 such wells. It is extremely important that these wells be so constructed that there will be no migration of oil, gas, and salt water into the fresh water sands. During drilling, adequate surface casing must be set to protect the fresh water sands. If the well is a producer it must be properly completed with adequate casing and proper cementing to safeguard the fresh water sands. If it is a dry hole, an adequate cement plug must be set to seal off the salt water from the fresh water strata and the surface must be sealed to prevent contamination from the surface.

In many fields in Louisiana, a large amount of brine is produced with the oil and gas. In many instances it is necessary to dispose of this brine underground by injecting it into salt water strata. The conservation department regulates this disposal and issues permits only when geological investigations made by the Louisiana Geological Survey show that the proposed injection strata carries salt water and there is no danger of contamination of fresh water sands. Proper engineering safeguards are required in the construction of these wells to insure protection of fresh water sands.

The department of conservation also regulates and issues permits for the underground disposal of liquid waste from industrial plants and other sources. This kind of disposal is increasing because at the location of many plants there is no means of surface disposal or the character of such wastes is such that they are not permitted to go into streams. Permits for such disposal are granted only after thorough geological and engineering studies made by the Louisiana Geological Survey and Conservation Department engineers show that fresh water strata will not be contaminated.

In order to have adequate information for the protection and development of our underground fresh water, the Louisiana Geological Survey has carried on a program of investigation of this valuable resource since the survey was founded in 1934. Previous State geological surveys also carried on research into our fresh ground water resources. Presently these investigations are carried on as a cooperative project by the Louisiana Geological Survey, the State department of public works and the U.S. Geological Survey. The costs are shared equally by the State and Federal Governments. The actual work is done by the U.S. Geological Survey and results of these investigations are placed on open file and published so the information can be available to the people.

These investigations consist of a program of basic data collection and research so that we will know:

1. Where our fresh ground water is located.
2. How deep it is.
3. How much there is.
4. Quality of water.

We already know that Louisiana has vast quantities of fresh ground water but that it is not evenly distributed geographically. However, it is being developed and used by individuals, municipalities, industries, farmers, and others and although local problems have occurred we have been able to handle these problems with our present rules and regulations. We feel that with our present program of investigation, that we will have adequate information for the development and protection of our fresh ground water. Of course, this program will need to be changed from time to time to fit future conditions and needs.

Should it be necessary in the future to have more rules and regulations for the protection and development of fresh ground water we feel this is a State responsibility and can best be handled by the State of Louisiana. The Federal Government should continue appropriations to the U.S. Geological Survey for ground water investigations because this is an important and necessary function.

There has been a lot of talk and discussion recently about the problem of disposal of atomic wastes. It has been suggested that these atomic wastes be stored or disposed of underground. Studies are being made by Federal agencies and others to determine if this is feasible. This is a serious problem and adequate measures should be taken to protect all of our waters, fresh and salt, from contamination by these wastes. I am sure that this will be done but I believe the proper State authorities should be consulted and advised about these investigations and plans. In most States the proper agency would be the State geological survey. In Louisiana it would be the State department of conservation and the Louisiana Geological Survey.

In considering the development of our national water resources, I believe we should give more attention to our underground salt water or brines. These brines occur in all areas of the United States and are a potential source of minerals such as iodine, bromine, magnesium, calcium, sodium, and other minerals. Brine low in salt and mineral content are also possible sources for fresh water by proper treatment. In the future, treatment of such brines may be economical enough for this purpose. Research organizations such as the U.S. Geological Survey and the various State geological surveys should include the study of these brines in their program and they should be furnished with adequate funds for such research by the various appropriating agencies.

That is the end of my prepared statement but I would like to make a short statement in regards to one of the other papers and I ask the reporter to take it down.

I would like to say that the State of Louisiana—the authorities in the State—are cognizant of the problems in the Lake Charles and southwestern Louisiana areas which were discussed by Mr. Wolbrette and Mr. Glendon Smith. The State and the Federal Government—that is, the U.S. Geological Survey—have made investigations in the southwest Louisiana and also in the Lake Charles area. Presently we have a report on the ground water resources in the Lake Charles area which is being printed. When that report is printed we will distribute it to the people in southwest Louisiana and to others who are interested.

We are continuing our investigations in the Lake Charles area and in the southwest Louisiana area, and this last July our State legislature furnished us with more funds for ground water research and we have been able to hire an extra man. That is to put on an extra man in southwest Louisiana.

I just wanted to get that in the record that we are working in southwest Louisiana and in the Lake Charles area trying to find the answer to those problems.

Senator ELLENDER. Thank you very much, sir.

Next witness.

Mr. WIMBERLY. Next we will pass to wildlife and fisheries, and I would like to present Mr. T. B. Ford, acting chief, fish and game division, Wildlife and Fisheries Commission, State of Louisiana.

Senator ELLENDER. All right, Mr. Ford. You may proceed, sir.

STATEMENT OF T. B. FORD, ACTING CHIEF, FISH AND GAME DIVISION, WILDLIFE AND FISHERIES COMMISSION, STATE OF LOUISIANA

Mr. FORD. Thank you.

Mr. Chairman and Senators of the Select Committee on National Water Resources, I am T. B. Ford, acting chief, fish and game division.

I present the following summary of the Louisiana Wildlife and Fisheries statement which is being presented to you at this time. A complete statement is being provided for inclusion in the record of this hearing.

I might digress for a moment. I also made available to you a copy of the statement by the Louisiana Oyster Dealers & Growers Association who are also interested in water resources.

I have additional letters which I would like to submit because the shrimp association did not understand the procedure of the committee nor did the Menhaden Advisory Council of Louisiana.

I would like to submit their letters, too, and they will submit written material later on.

The CHAIRMAN. The statement that you presented for the Oyster Dealers & Growers Association, as well as your own, will be filed for the record at this point and the letters that you refer to and other statements will also be filed.

And the letters that you refer to and other statements will also be filed.

Mr. FORD. Thank you, sir.

The CHAIRMAN. If there is no duplication, we will incorporate them in the record.

Mr. FORD. Thank you, sir.

(The statement follows:)

STATEMENT OF THE LOUISIANA OYSTER DEALERS & GROWERS ASSOCIATION

The members of the Louisiana Oyster Dealers & Growers Association feel that if the fresh-water program proposed by the Louisiana Wildlife and Fisheries Commission is carried out our industry will prosper tremendously.

Since the level of the Mississippi River has dropped in the past 10 years due to the fine flood-control works carried out by the U.S. Army Engineers, and since other sources are also captivating the fresh water so badly needed for the

propagation of the oyster industry, it has become increasingly necessary to insert fresh water by artificial means into growing areas where it is needed.

Since the water level of the Mississippi has dropped, the fresh-water line has moved closer and closer inshore, leaving once flourishing oyster beds barren. As the fresh-water line moved in, the conch (or oyster drill) has moved in right behind it, causing much damage to the oyster beds; also, due to the high salinity, the disease dermacystidum marinum now flourishes in many areas where fresh river water kept the disease dormant.

Our industry is confronted with many serious problems; progress is chopping away at us from all sides: Ship channels and waterways with their huge spoil banks which cut off currents and silts up large areas; seismograph operations which destroy the oxygen in the water bottoms, starving the oysters and chasing away other marine life. We could go on and on as to what hurts our industry, but since this is a conference on fresh-water problems, we are all agreed that if this wildlife and fisheries program is carried out, our industry will be getting the relief it so badly needs.

We oyster cultivators do not consider ourselves to be scientists or biologists but, nevertheless, when it comes to the growing of oysters we consider ourselves to be experts. We feel we can safely say that if fresh water is put into the suggested areas, that within 3 years after the completion of these projects our industry will double its present production in these areas.

If you want to know what this means in dollars and cents, I think it will mean an increase of $2 to $3 million per year. If an adequate program is carried out in this area, I do not hesitate to estimate that Louisiana can become the leading oyster producing State in this country.

Gentlemen, in Louisiana we have the ingredients to produce oysters; we have the salty waters of the Gulf of Mexico, and down the middle of this, the fresh waters full of minerals from the great Mississippi River. All that is needed now are the resources to carry out the projects that we now have planned. Of course, when I say all that is needed now are the resources, I know that in itself is the biggest job.

If you people who establish policy that governs these matters will just consider the seriousness of our problem, I am sure you can help our industry regain the production level it once enjoyed.

Respectfully submitted.

NORMAN G. HEDRICK, Jr.,
President, Louisiana Oyster Dealers & Growers Association.

MENHADEN ADVISORY COUNCIL FOR THE GULF OF MEXICO,
New Orleans, La., November 27, 1959.

Mr. TED FORD,
Louisiana Wildlife and Fisheries Commission,
New Orleans, La.

DEAR MR. FORD: The Menhaden Advisory Council for the Gulf of Mexico, of which I am chairman, was pleased to learn that you have been invited to appear before the Senate Select Committee on National Water Resources next week and to present a summary of the water needs for Louisiana's commercial and sport fishing resources.

The advisory council represents that portion of America's largest fishery which operates in the Gulf States from Florida to Texas.

The five companies which make up the advisory council are engaged in the taking and processing of menhaden, a small, migratory salt water fish that is caught in vast quantities and manufactured into three basic products including fish oil, fish meal, and fish solubles.

These products, in turn, are basic ingredients in hundreds of consumer items ranging from cosmetics to rustproof paints and high protein poultry and animal feeds. So far reaching is the importance of the menhaden industry that almost every American, in a day's time, uses one or more products whose manufacture depends, at least in part, on menhaden oil, meal, or solubles.

The menhaden industry is vitally interested in the subject of water resource conservation. This interest steps from two principal reasons:

First, our processing plants use great quantities of steam and fresh water in the manufacturing process. Without adequate fresh water, it would be impossible for them to operate.

Even more important is the dependence of immature menhaden upon fresh water in the coastal nursery grounds or estuarine areas where the young menhaden grow to adult size.

To fully appreciate this latter dependence, one must understand something of the menhaden's life cycle. Like the shrimp and many other creatures which live in salt water, the menhaden spawns in the open sea and its eggs are carried into the estuarine areas on the tides. The young menhaden hatch out and grow in these protected inland waters until they reach sufficient size to return to the sea.

There is a close balance between the proportions of fresh and salt water which make up the ideal environment for the menhaden nursery grounds. Anything which is done to create an imbalance almost always results in great destruction of the menhaden population.

To cite only one example of the importance we place on maintaining and protecting these estuarine areas, I call to your attention the project which the menhaden industry has started on the Atlantic seaboard to purchase wetlands areas and set them aside for nursery grounds. In New Jersey alone, some 20,000 acres have been bought and set aside by menhaden operators.

As one of our people so amply put it: "We are in the menhaden business, not the real estate business. But the only way we can stay in the fishing business is to guard those marshes."

This work, of course, is merely a "drop in the bucket" to what is needed, but we feel it is a step in the right direction.

We hope that this presentation, though very brief, will serve to explain our position regarding the subject of water resources and their importance to the menhaden industry.

Sincerely yours,

HARRY I. MCGINNIS.

LOUISIANA SHRIMP ASSOCIATION,
Golden Meadow, La., November 18, 1959.

Mr. K. E. BIGLANE,
Chief, Division Water Pollution Control,
Louisiana Wildlife and Fisheries Commission,
Baton Rouge, La.

DEAR MR. BIGLANE: In reply to your letter of November 5, here is the information you requested.

Shrimp, which has a direct commercial value in excess of $35 million to Louisana, has such a value due to our very fortunate wealth in natural nursery grounds. Louisiana's estuarine area, its bays, lakes, and bayous, because of their salinity are perfect nursery areas for the young shrimp. If the amount of fresh water flowing into these areas was decreased in anyway, it would reflect immediately, we feel, in a lower production of shrimp. The light salinity, brought on by our fresh-water outlets, is one of the variables which directly affects the coastal area's main economic foundation. Actually, we need strong protection on our present grounds to help the local industry compete with the deluge of shrimp imports on our markets.

I think you will find that most of the above applies also for the oyster industry.

The biological reason for the effect of salinity on our shrimp crop will have to be acquired from other sources. My knowledge is through observation and many years of experience. We do know that Louisiana's coastline gives hundreds of boatowners an opportunity to make a living because of the abundance of shrimp in the estuarine areas.

I sincerely hope that this information will be of some use to you. Call on us any time you feel that we may be of assistance.

Respectfully yours,

J. H. SUMMERSGILL,
President, Louisiana Shrimp Assocation.

Mr. FORD. Thank you, sir.

The commission commends the 86th Congress for the foresight in water use planning as demonstrated by Senate Resolution 48.

The apparent intent of certain aspects of this resolution closely parallels provisions included in the recently amended Fish and Wildlife

Coordination Act. Consequently, the several million citizens who hunt and fish should heartily endorse continuing congressional activity in their behalf.

More especially we commend your committee for the scope and approach you have established in considering the future water needs.

In accordance with Senate Resolution 48 you are here today gathering material to help you determine the following:

1. The extent to which water resources activities in the United States are related to the national interest; and
2. The extent and character of water resources activities that will be required through 1980 to meet the Nation's agricultural and industrial needs along with suitable provisions for related recreational and fish and wildlife values.

It is the intent of the Louisiana Wildlife and Fisheries Commission to substantiate, one, that within this State water resource planning when associated with fish and wildlife is of a national interest, and, two, that there is a need for provisions for fish and wildlife values in future planning.

Louisiana serves as the geographic gateway to the entire Mississippi Valley by means of the Mississippi and Red Rivers and is bordered in part by the Pearl and Sabine Rivers.

Historically, these interstate rivers with their extensive tributary systems have contributed to and influenced the physiographic and ecological features of this land and water area. Our people have had to adapt to the water cycles, especially as they occurred until recent years.

There is no other area in the United States comparable to the delta system which was developed along coastal Louisiana, including almost 5 million acres of marsh areas alone, the ecology of marsh and bottom land swamp areas resulting from the action and forces of these streams and their water cycles provided the choice environment for the extensive development of fish and wildlife resources.

The Louisiana Legislature, in recognizing this rich heritage of fish and wildlife resources and their identity with the lives of our citizens, have coined the motto "Sportsmen's Paradise" which is imprinted on our vehicle license plates.

These areas are important today for they afford many opportunities for meeting future regional and national needs.

The economic relationships of these fish and wildlife resources are of sufficient magnitude in our opinion to warrant consideration among all water interests in present and future plans since the various *aspects associated with use are national in scope.*

Under our present licensing regulations which are quite liberal, *there are 281,656 licensed sportsmen spending an estimated $80,480,-*000 and 246,731 licensed hunters spending an estimated $41,850,000 *annually.*

When these data are projected to 1980, according to present liberal *licensing regulations, we expect 452,000 licensed sports fishermen and* 427,700 licensed hunters to spend $239,075,000 annually.

Other data indicate that only one in eight sports fishermen and one in three hunters are licensed in this State. Thus there are far *more people who participate in these recreational activities than are* licensed.

A factor contributing to the difference in numbers between fishermen and hunters is the year-round availability of fishing opportunities while hunting is limited to about 5 months of the year. Even so, these opportunities should be of national interest in planning for future regional or national needs.

Average commercial production values associated with fish and wildlife resources in Louisiana is over $56 million annually and is distributed among thousands of workers and their families. This production is of national interest for it includes high quality foods and a number of industrial products such as oilmeals, shells, and furs. In our opinion it is of great importance that there is no general surplus of these products, sportswise or commercialwise for difficulties are experienced in meeting present needs in certain areas.

Because of the uniqueness of its geography and resulting ecology any major change in water within any of the several drainage systems which terminate in this State can definitely affect the fish and wildlife.

The commission is fully aware of the current population, agricultural, and industrial water needs. Also we understand the impact of expanding populations and associated water demands. Accordingly we advocate the inclusion of fish and wildlife as an appropriate part in new future water planning.

The State of Louisiana and the fish and wildlife professionals would be shortsighted if they did not consider the resource perpetuation and utilization on a regional or national basis.

This Nation is rapidly reaching the point where the need for recreational outlets must be established to coincide with the methods of living. For the most part fish and wildlife areas should be maintained or established in relation to human population distribution to provide fishing and hunting opportunities to the public. The days of 20- to 30-mile drives to go hunting or fishing are about over for many people. The need for broad-scope planning of recreational use is urgent. While this may sound like a new approach to the fish and wildlife, it is a point that future planners are accepting. In keeping with this approach a general look at the State's vast and rich resources will clearly substantiate that in national water-use planning this State, along with numerous other opportunities, offers fish and wildlife potential which if properly used can help meet the national needs.

The Commission is of the opinion that with proper planning and recognition, needs for fish and wildlife can be met without adversely affecting proper use of water by other interests.

In keeping with the above approach it is evident that these resources in Louisiana are of national interest and there is the need for including provisions for fish and wildlife values in future planning.

There are, of course, problems involved in the competition for water with other interests. Many of the problems can be resolved by adherence to provisions as already set forth in the amended Coordination Act.

These problems are discussed in detail in the submitted statement and time precludes mentioning them here today.

In conclusion, I wish to point out to the committee that Mr. Spencer Smith of the Atlanta regional office of the Bureau of Sports Fisheries and Wildlife is present and will be glad to answer any questions the committee should care to direct to him. Mr. Smith is regional

supervisor for the river basin studies of the 12 Southeastern States and therefore has comprehensive understanding of fish and wildlife as associated with water resource development projects.

The two letters that I have made reference to earlier are from Mr. J. H. Summersgill, president, Louisiana Shrimp Association, Mr. Harry I. McGinnis, chairman, Menhaden Advisory Council for the Gulf of Mexico——

The CHAIRMAN. Those will be filed for the record as well as the statement of the oyster people and your own.

Mr. FORD. Thank you, sir.

The CHAIRMAN. Thank you. Any questions?

Thank you very much.

(The statement referred to follows:)

STATEMENT OF THE LOUISIANA WILD LIFE AND FISHERIES COMMISSION BY R. P. EASTERLY, DIRECTOR

I. INTRODUCTION

The Louisiana Wild Life and Fisheries Commission is pleased to acknowledge the interest of Congress and, in particular, the Senate in national water resources as indicated by the establishment of the Senate Select Committe on National Water Resources pursuant to Senate Resolution 48, 86th Congress. We would like to express our appreciation to the committee for the opportunity to present to you, here in Louisiana, views of fish and wildlife interests relative to present and future problems associated with water resources. Some of these problems are peculiar to Louisiana, while others are unalterably associated with other States thereby fully justifying this national interest.

This Commission is represented here today for, by constitutional law, it is charged with the responsibility of protecting, conserving, and replenishing the natural resources of the States, the wildlife of the State, including wild game and nongame quadrupeds or animals, game, oysters, fish and other aquatic life. We are interested in meeting and discharging these broad and highly important responsibilities now and in the future in the interest of the citizens of this State.

Louisiana has been blessed richly with many natural resources—renewable ones, such as fish, wildlife, and forests. We are concerned with the wise use of these fish and wildlife resources and any laws, programs or projects which affect them, since our responsibility is clearly defined. The Louisiana Legislature, in recognizing this rich heritage of fish and wildlife resources and their identity with the lives of our citizens, has coined the motto "Sportsmens Paradise" which is imprinted on our vehicle license plates. It behooves us to maintain and perpetuate this status.

We would like to emphasize the significant value of these fish and wildlife resources by establishing and recognizing their relationship in the overall economy. Administrators and technicians engaged in and concerned with these resources have found them to be commensurate or greater in value than any single agricultural commodity in Louisiana. Therefore, in our opinion, this field of interest deserves and merits equal status with other primary interests concerned with water resources.

Fish and wildlife resources are products of land and water. As such, these are closely associated and identified with water requirements, both in quantity and quality, even in the upland as well as the wetland areas. Productivity levels among some of these resources parallels that of agriculture and forestry and sometimes exceeds these on lands or waters of comparable fertility. Some land and water areas are obviously more suitable to wildlife than agriculture, and these should be maintained in a productive condition. However, we would like to emphasize that fish and wildlife can be compatible with agricultural and forestry practices under adequate provisions. Similiarly, these natural resources can be compatible with water use programs in industrial, power or flood control reservoirs or impoundments where adequate planning and provisions are incorporated within the framework of the projects.

Statistical surveys of the direct and indirect values of fish and wildlife resources to our economy were made in the past few years by this commission

and the U.S. Fish and Wildlife Service. Additionally, our survey provided assistance in developing future programs to help meet the increasing needs reflected by the rapidly expanding population.

Prospective shorter work weeks emphasizes the importance of providing outdoor recreational opportunities. Sport fishing and hunting attract a major portion of this interest which is substantiated by the expenditures made in pursuit of these endeavors.

The present State population is estimated to be 3,200,000 and it is expected to increase to 4,300,000 in 1980. License sales show that only 7 percent of the sport fishermen (218,757) and 8 percent of the hunters (246,731) are licensed. However, other information indicates that only one in eight sport fishermen and one in three hunters are required to be licensed due to quite liberal State regulations. Thus, it is evident that major segments of this population have an interest in fish and wildlife resources.

Dollar value estimates were limited to the licensed sportsmen. These fishermen spend an estimated $80,480,000 annually in pursuit of this form of recreation. The average annual value per fisherman is $368, which includes a straight 20-percent depreciation of equipment over a 5-year period. Similarly, licensed hunters spend an estimated $41,850,000 annually, which provides an average value per hunter of $170, including a similar 20-percent depreciation of equipment.

Estimates for the 1980 population, based upon the above data relative only to licensed sport fishermen and hunters according to the present license regulations and current trends suggest substantially increased expenditures. Based upon current levels and in our opinion, annual expenditures of 452,700 sport fishermen will be approximately $166,525,000 and that of 427,700 sport fishermen will be approximately $166,525,000 and that of 427,700 hunters will be about $72,550,000. Such obvious differences between fishing and hunting expenditures as shown above can be readily explained. Louisiana's weather conditions and variety of waters afford year-round fishing opportunities, while hunting opportunities are limited essentially to only 5 months out of the year. These substantial differences suggest to us the importance of providing opportunities for recreation.

In relation to the above evaluation of Louisiana's fish and wildlife resources, it should be recognized that the Federal Government has the primary responsibility with respect to migratory birds. However, the States share in this responsibility considerably and, unquestionably, the cumulative contribution of the States greatly exceeds that of the Federal Government, as it should. As an example of the value of waterfowl to a segment of our population and some pertinent problems associated therewith, we would like to briefly outline them. Since 1951, this commission had devoted considerable attention to this field of interest in addition to others. Listed below are pertinent facts associated with this wildlife resource.

1. Louisiana's wintering waterfowl day use amounts to 711,915,000 days, which is distributed over portions of its 10,816,695 acres of wetlands subdivided as follows:

	Acres
(*a*) Inland fresh water acreage	6,038,943
(*b*) Coastal fresh water acreage	4,068,452
(*c*) Coastal salt water acreage (not including open gulf acreage)	709,300

2. Drainage and other works have greatly reduced the value to wildlife of much of the wetlands.

3. Present wetlands habitat appears to be adequate for the waterfowl in providing resting and feeding areas, but it is distributed and controlled in such a way that public hunting places are becoming more limited each year.

4. Our estimates indicate that 100,000 licensed waterfowl hunts spend $17 million annually in pursuit of their sport. This does not include any value for nonlicensed hunters.

5. It has been suggested that an army of people enjoy observing and studying waterfowl and shorebirds in Louisiana. This esthetic value is certainly important, but we are unable to derive a satisfactory economic evaluation for this use.

6. In 1980, the demand will be increased markedly if increases in the past 25 years denote trends with reasonable accuracy.

7. Additional wetland acreage will be needed to sustain waterfowl hunting as is known today, and we expect the flights of waterfowl to continue indefinitely.

8. Increase the value of low-quality existing wetlands.

9. Create an additional acreage of wetlands, possibly 20 percent, to meet future demands.

Thus, in our opinion, these represent positive values to local, State, and National economies and to our general well-being for the pleasures afforded. Their resquisite identity with water resources requires maximum, multipurpose use and full consideration in any water control work.

A comparison of the data obtained through Louisiana's FW–1–R survey with that of the U.S. Fish and Wildlife Service, both of which were conducted about the same time, shows a marked difference in the average annual expenditures by sport fishermen and hunters. These data were as follows:

Average annual expenditures per man

	Sport fishermen	Hunters
Louisiana	$292	$115
National average	92	80
Total	200	35

In our opinion, these differences are attributed to the availability of greater annual opportunities in Louisiana. These contributions to our economy, affecting virtually every type of business, are needed and should be expanded.

Commercial aspects of fish and wildlife resources command a prominent interest in view of their dollar value to the economy; their provision of high quality foods, numerous fishery derived products including oil, meal, solubles, shell, etc.; and, their provision of livelihoods for thousands of workers and their families. The total annual value of these resources derived chiefly from Louisiana's wetland areas including the freshwater streams, lakes, and swamps, the marshes, the estuarine inside waters and alsco the coastal gulf waters is over $56 million. This value is based upon a 3-to 5-year average net production which allows for a compensation of annual fluctuations due to natural causes or other factors.

The fresh and salt water fishery produced over 32 million pounds of marketable fish annually. This represents an approximate value of $4,500,000 to the fishermen.

A single marine fishery is based upon menhaden. Reduction of these fish provides oil, meal, fertilizer and fish solubles. The annual net value to the producers is about $6,500,000.

Oysters, oyster shells and clam shells comprise another valuable segment of this commercial production. The average annual oyster harvest yields 750,000 barrels, which is extremely subject to environmental conditions. During good years, up to 1 million barrels may be produced. Annual values to the oyster and shell industries appears to net $13,500,000 to the producers.

Major dollar values are attributed to the production of shrimp. In recent years, annual production has varied from a low of $10 million to a high of $25 million to the producers. However, the average value for the period 1956–58 was found to be $19,200,000.

Furbearers have contributed significantly to the Louisiana economy for many years. More recently, fur production has declined due to many factors; nevertheless, it is still a good cash crop. Nine species of furbearers, derived largely from the marshes, yield 2,300,000 pelts valued at $2,500,000 annually. During the middle 1940's, a peak production and harvest of furbearers yielded about 13 million pelts with a net value of about $13 million. The obvious difference in the above production values is attributed more to encroachments of several kinds by man which contributed greatly to ecological changes of marsh areas. Cyclic fluctuations of some animal populations may be pertinent to this in a minor way, but, in our opinion, can in no way account for this vast difference.

Other associated commercial dollar values amount to $425,000 annually. These moneys are derived from the sales of licenses and permits and also from the col-

lection of severence taxes, which are required by law for engaging in the many phases of the above production groups.

Thus, in our opinion, the 1960 value of Louisiana's fish and wildlife in the amount of approximately $180 million merits equal consideration and is substantially on par with other interests associated with water resources. If we project this value to 1980 with the assumption that commercial production will remain status quo, then the value of the resources will be $294,775,000. However, demands for increased commercial production can be expected to increase with the poulation and their value should be revised upward.

In our opinion, there is no surplus of these products, sportwise or commercialwise, for difficulties are experienced in meeting present needs in certain areas.

II. USES AND NEEDS

Geographically, Louisiana serves as the gateway to the entire Mississippi Valley, a broad expanse constituting the major basin and watershed of this country. The Mississippi, Red, Pearl, and Sabine Rivers with their extensive tributary systems are interstate rivers which have contributed to and influenced the physiographic and ecological features of this State. Historically, Louisiana has received the waters derived throughout the basins of these river systems and has been required to adapt its economy and livelihood to the water cycles as they occurred. The greatest deltaic system in this country including almost 5 million acres of marshland has developed along coastal Louisiana as a result of these forces.

The ecology of our wetlands, the bottomland swamps and marshes, is closely identified with and largely predicated on these water cycles. For example, the greatest natural production of game and commercial fresh water fishes, of which we are aware in this country, occurs in our backwater overflow areas. It almost goes without saying that this Red River backwater area enjoys an excellent sport-fishing reputation among sportsmen of Louisiana and surrounding States. Fishing success peaks generally occur immediately following high and prolonged overflow periods during the spring. Annual flooding of streams and overflow areas throughout the State contributes to the successful spawning and propagation of our fishes by providing fresh water, more space, more food, and waters of increased fertility, including necessary organic and inorganic substances.

Before the advent of levees along the major and minor streams throughout coastal Louisiana, this annual flooding distributed these waters and nutrients as well as sediments in the bottomland swamps, marshes, and primary deltaic areas while enroute to the gulf. These forces established and maintained the extensive hardwood swamps and brackish water estuarine coastal marsh areas. These areas have been richly productive of furbearers, waterfowl, other wildlife forms, shrimp, oysters, food and commercial fishes, and other important aquatic animals. Yet, more striking and more economically intangible is the fact that these estuarine areas serve as the nursery grounds for many of the marine animals harvested at sea. Analysis and comparison of fisheries' productivity with other areas indicates that the major difference between the marine waters of Louisiana and those of other States is the combination of its volumes of fresh water and the extensive estuarine areas. Since the levees have been established, almost to the mouths of streams, the continual building of the marshes and essentially ceased due to the absence of overflow over natural streambank levees. No doubt, subsidence (compaction and settling of materials) of the marshes will be more evident in the future. Fortunately, coastal and tidal currents have carried some of the fresh, high nutrient waters into estuarine areas which has helped maintain generally good conditions and productivity, especially during periods of high river discharge.

Louisiana's population of over 3 million is increasing well within limits of the national average. Presently, major portions of this population are centered in such major areas as New Orleans, Baton Rouge, Lafayette, Lake Charles, Alexandria, Monroe, and Shreveport. Recognizing some of the various factors which stimulate and contribute to population increases, it appears to us that these areas will continue to increase, possibly even more rapidly. Recent developments along the Mississippi River from below New Orleans to Baton Rouge suggest a future complex of intensive development with an associated greatly increased population.

Today, it can be stated conservatively that most of the water areas of the State, of which there are many, are receiving heavy use if they afford reason-

able fishing and/or hunting success. Even so, some will be able to provide much greater use in subsequent years as demand for the less accessible areas develops. Presently, major and minor streams of several types are providing many opportunities for fishing, ranging from rigorous float trips on the creeks to the more casual trips on the slow-moving bayous and open rivers to excellent backwater area fishing. Lakes, such as old river oxbows, reservoirs, and farm ponds are also providing many fishing opportunities. In our opinion, farm ponds will help contribute to the provision of opportunities, but for the most part are private and will not substantially provide public opportunities. Along the coast, estuarine areas, including lakes, bays, and bayous are particularly attractive, and will continue to afford tremendous fishing opportunities in the future. Offshore fishing is continuing to increase in popularity and will contribute much to the provision of opportunity. In respect to these areas of opportunity, it relates for the most part to both the sport and commercial fisheries.

Reference is now made to existing hunting opportunities. Public facilities are limited today, in general, and the outlook is not bright. This situation is particularly critical in most of the previously designated highly populated areas of the State, and more so in coastal Louisiana where public use is becoming quite restricted. The majority of people represented by elected and appointed officials at all levels of government are comprised of the average and little man, economically speaking. These people also comprise the average hunters who are rapidly becoming "the have-nots" with respect to hunting areas. We believe that meeting these needs is a State function except where Federal lands and waters are available; in these situations, we believe that such lands should be made available to the public, either through the State or directly, to facilitate the meeting of current needs. Our department proposes to augment its activities in the acquisition of areas for fish and wildlife and subsequent public use provided the hunters are interested in investing for the future through increased license fees. This seems feasible and we are optimistic for recently Congress was well supported in its increase of the duck-stamp fee so as to save and provide important waterfowl areas in this country.

A few years ago, it was thought that man's activties could change and influence only the inland and estuarine water areas. Now, even this is no longer true for we exercise some concern about the influence of radioactive materials in the Gulf of Mexico and other marine waters. Many fish (species and populations) are migrant and are not limited just to Louisiana waters. Their relationships to the web of life of the sea suggest many pertinent questions about the dispersal of such materials and the subsequent uptake and concentration in food forms used by man.

The recognition of present uses of water resources in the fish and wildlife field of interest emphasizes, today, specific needs with respect to certain populated areas and especially so if variety of opportunity is considered. This factor of the individual's interest in all phases of life and its recognition by others had served as the bulwark of strength in the history of our country. The recognition by Congress of the need for the conservation and wise use of water and allied resources impresses upon us the need for this recognition among all interests. More particular, this would suggest that an end is in sight for our national "progress by natural resources destruction" era.

Several of the major needs today are quite obvious. Foremost among these is the provision of public access to public lands and waters for fishing, hunting, and a multitude of other recreational activities. This is clearly recognized as local, State, Federal, or joint responsibilities, depending entirely on the specific area. Considerable sums of money have been expended on all types of water projects in Louisiana in the public interest with amazing shortsightedness as related to multipurpose uses. These facilities have been constructed with public tax moneys and little or no provision has been made to assure public access and use in perpetuity or for the life of the project. As a Federal example, the Atchafalaya Floodway can be cited. Flowage and flooding easements representing suggested levels of 75 to 100 percent of the fee simple value of the land were purchased to meet the flood needs. For comparatively little more, the land itself could have been purchased which would have minimized future problems. Additional submarginal agricultural and other developments within the floodway would have been prevented so that the primary purpose of the original purchases could be served always without the possibility of future flood-damage payments.

A complimentary feature, nonconflicting in purpose, would have been the availability of the area to the public for fish, wildlife, and other recreational pur-

poses. On the other hand, the Bodcau flood control reservoir lands were acquired in title and are now serving their primary purpose, while nonconflicting fish, wildlife, and other recreational developments are proceeding in an orderly manner. This is and will be a credit to the Federal and State agencies. Similar State examples could be cited also. These above cited Federal examples will serve as guides and should impress high level local, State, and Federal elected and appointed officials with the need for policy changes to provide for public access and use of facilities constructed and developed with public funds.

Additional facilities associated with water resources are needed today to meet the needs of the people in the more populated areas. These include access to public areas, impoundments, and hunting areas. Many of the areas available in the past, especially in the marshes, are becoming posted and are no longer available to the public hunter. Today's trends suggest that the "open range" concept for cattle as well as people is rapidly changing. For example, a 9 percent reduction in hunting license sales from 1957 to 1958 means to us that there were just fewer areas available to the hunting public since there were no apparent comparable fluctuations in game populations. The same principle is also applicable to many fishing areas. Ecological changes as a result of various works has reduced the quality of many such fish and wildlife areas.

Fresh water from streams is needed in the marshes. Recognizing the various developments adjacent to major streams makes it impractical to eliminate existing levees. However, a positive approach to meet these present needs is the installation of control structures in the levees to permit gravity flow of water as needed and more particular in volumes needed. This management practice would reduce salt water intrusion, increase the fertility of estuarine waters and replenish mineral sediments, thus overcoming some of the subsidence in these areas. Benefits can be expected to aquatic animals, such as oysters, shrimp, crabs, fishes, and other food chain organisms of the sea, waterfowl, shore birds and fur bearers. Among these are animals of high economic importance and others are of esthetic, scientific, or life cycle importance to the ecology of the area. It is conceivable that in time estuarine fisheries production may be actually managed and in part controlled by regulated fresh water introduction. The value of such increased seafood production could be invaluable when the tremendous food frequirements of predicted expanding human populations is considered.

Perhaps one need of foremost importance today is that of proper management of existing and proposed additional facilities which are desirable to meet current needs. Progress is being made in this area of our social structure, although it is slow. It is recognized that this is primarily an educational problem and efforts in this direction are limited to the past 20 to 40 years or even more recently, for the tools of knowledge previously were unavailable. Reasonable discouragements becomes diminished when cognizance is taken of the grassroots approach to agricultural problems and practices by the Federal and State Governments with the able support of many trained workers and unknown sums of money over a long period of time. This lends support to the desire and hope that this problem in the fish and wildlife field can be reduced or solved within a reasonable period of time.

III. PROBLEMS

The keynote of problems associated with water resources in fish and wildlife resources fields today can be stated simply as the preponderance of drastic ecological changes. This causes deep concern among technically trained personnel and some few sportsmen, commercial fishermen, and trappers who have recognized and developed an appreciation for these situations. The evidence of many local, State, and Federal water control projects in Louisiana suggests single-purpose approaches of the past and present, with some exceptions, as being inadequate for the best public interest when reviewed critically by fish and wildlife specialists. Examples of such inadequacies will be found among projects for flood control, drainage, navigation, and fish and wildlife. Failure to include provisions for maximum or multipurpose uses including fish and wildlife in the best public interest resulted because of several reasons. These appear to be subject to grouping as follows:

1. Lack of foresight: Who could or was capable of predicting years ahead what the situation would be today since vast opportunities existed at that time.

2. Unawareness: Few people, if any, were equipped with the tools of knowledge to be able to plan intelligently for the future.

3. Lack of information in all groups: Quite likely, the primary project purpose masked other equally important considerations while heroes were made because "they did something" while other interests failed to participate.

4. Competition for funds: It would appear that less costly and less complicated single-purpose projects would compete more favorably on an area or national basis, whereas, multipurpose projects cost more; perhaps of greater importance is the fact that the single-purpose supporting citizen groups objected to the additional cost since the project might be delayed or considered to be too costly by the governmental body authorizing and appropriating public moneys for the various projects.

Regardless of the factors which may have contributed to these situations, we would like to acknowledge them for the primary purpose of progressing by these experiences. Let these previous activities suggest, describe, and define procedures for avoiding and preventing any losses of fish and wildlife resources in the future.

Among present-day problems is the reduction of fish and wildlife habitat as a result of various other private developments associated with water resources. Notably in the marsh and estuarine areas which are readily subject to a variety of forces including tides, winds, currents, variable salinities and temperatures, developments such as pipelines, channels for oil rig barges, and pollution, cause extensive damage to the animals and their habitat. These influences resulting from dredging, drilling, and industrial production activities are particularly obvious on oysters, natural oyster reefs, and oyster beds. Documented examples include the following: Oily tasting oysters; cutoff oyster beds in arms of small bays and bayous; the loss of beds due to siltation resulting from a change in current caused by spoil banks whereby heavy silt-laden waters drop their load, thus smothering the oyster beds; and, the actual physical loss of oyster beds or natural reefs due to dredging of channels or spoil placement. The extent of these damages and losses becomes accentuated with the recognition of the fact that there are by 50,000 to 60,000 acres of water bottom under private leases for oyster culture out of approximately 2½ to 3 million acres of available water bottoms.

If there were more good bottoms that met the life history requirements of the oyster, it would be leased also. The influence of these factors on many other aquatic and terrestrial plants and animals in estuatrine areas is not fully known; however, it is not generally beneficial. The pertinence of these matters lies in the fact that such permits for these developments are governed primarily by the corps, though limited to navigational objections.

There has been a failure to adequately consider all interests while apparently favoring a single interest. Fortuantely, more recent evidence lends encouragement that previous practices will yield and give rise to the more reasonable evaluation and inclusion of provisions for the overall public needs in the water resources field. Since the purposes of these public hearings is to delineate and define water resource problems at the present time and anticipated future ones, it is deemed necessary that representative problems in the various fields of public works be described as examples for consideration in the establishment of future policies, laws, and practices at high local, State and National levels of government.

For convenience, these examples are grouped as follows:

1. Flood control: The construction of the Bayou La Fourche canal, primarily in Morehouse, Oucahita, and Richland Parishes, provided drainage to submarginal areas, changed water cycles within the area causing some areas to go under water which had not been known to flood, resulted in the drainage of adjacent hardwood swamps causing some die-offs during drought years, and reduced a high quality sport and commercial fish and wildlife area. Fur records suggest that the total annual reduction in value was from $379,416 to $38,548, while commercial fish values, quite incomplete, suggest an annual reduction from $4,600 to $90 per commercial fisherman which numbered about 400 in 1952.

2. Levees: These structures in conjunction with other measures have reduced, if not eliminated, flood hazards along the Mississippi River in Louisiana which has permitted extensive developments of many kinds. However, old crevasses or distributaries were permanently closed, such as Bayou

La Fourche in Ascension, Assumption, and La Fourche Parishes. Subsequently, when the need for additional fresh water becomes critical for domestic, industrial and other purposes, it was necessary to install costly pumps to help meet these needs.

The extension of levees to the active deltaic areas of the Mississippi and Atchafalaya Rivers in recent years has effectively terminated the deposition of silt in and buildup of adjacent marsh areas. This development has also altered the ecology of marsh and adjacent estuarine areas for distances up to 30 miles by permitting salt water intrusion of brackish water areas. More noticeable effects occurred among the oysters and furbearers in brief periods following the completion of the levees.

3. Drainage: Many submarginal areas have been drained in the interest of agriculture, residential, industrial, etc., developments. This has resulted in an unnecessary lowering of water levels of lakes and bayous, as well as a lowering of the surface water table of higher elevation farm and forest lands. Subsequent evidence associated with some such projects would suggest that some of these projects were ill advised.

The rerouting, diversion, and reduction of floodwater periods appears to have contributed to and augmented aquatic weed problems. An absence of highly turbid waters through much of the internal drainage for reasonable periods of 4 to 6 weeks has encouraged the growth and distribution of these pests, since the swamp or drainage waters remain clear much of the time.

4. Navigation: The development of many navigation canals and channels has resulted in substantial changes to the ecology of many areas, especially coastal Louisiana. The Calcasieu Ship Channel has resulted in salt-water intrusion that has and is eliminating highly desirable marsh vegetation which is being replaced by low quality grasses. The Intercoastal Waterway has served to intercept natural drainage and divert waters along different patterns, thus upsetting the existing regimen. Recognition of many of these relationships has required a number of years. Other projects such as the Mississippi River-Gulf Outlet and Barataria Bay Waterway are expected to alter the existing water, currents, salinity, etc., regimen considerably in project areas which may extend further than the project site itself.

5. Recreation: The operation of some major impoundments constructed primarily for fish and wildlife could be planned to assist with local watershed flood control problems. Infrequently, if ever, has this been an alternate consideration.

In the past few years, there has been inadequate time, funds, or trained fish and wildlife technical personnel to adequately study the many proposed and surveyed projects. Even though the fish and wildlife State and Federal groups have endeavored to study, evaluate, and offer recommendations pertinent to these resources for most projects, it has been impossible for the above reasons to deal with them adequately or even in a manner comparable with the engineering surveys. Accordingly, this has contributed to the less than satisfactory treatment in many instances by the various authority levels of government. In a similar manner, there have been failures to accept recommendations for fish and wildlife features since these would require modifications in engineering plans and increases in project costs. In our opinion, these revisions were entirely justified.

Inspection and consideration of past and present factors describe future trends which emphasize increased needs for water resources in all fields. These include fish and wildlife, industry, power, navigation, argriculture, and possibly other major and minor interests not yet established.

There can be little doubt that the vast majority of past, present, and pending water-control projects were considered a necessity by the people who asked for them. While we have been critical of many of the past and authorized projects, it has not been intended to imply that these projects should not have been constructed, but rather that much of the damage to fish and wildlife resources could have been prevented with proper foresight, planning, and coordination of effort. In the opinion of most technically trained conservationists, gross and cumulative changes in the ecology of the State occur as a result of man's effort to occupy submarginal environments. These technical people are concerned with the fact that such changes are occurring which affect most of the renewable natural resources, and, more particularly, that over a period of 25 to 50 years these changes may be irreversible for many of these resources. Thus, in our opinion, these factors emphasize the need for, as well as, require careful,

comprehensive multipurpose considerations by all interests in approaching water resource problems.

In regard to future quantities needed, it is our opinion that all the surface and ground waters presently available plus more will be required to meet future needs for fish, wildlife, and other interests. We question whether present uses and practices as found in the water field will permit or sustain present and particularly future needs since having adequate quantities at the right time and place creates problems.

Categories of "quantity" and "quality" problems which merit consideration by all interests are as follows:

1. Insure minimal flows.
2. Compare influence of irrigation with respect to all interests.
3. Consider seasonal needs with respect to altering existing regimen of waters.
4. Water control and management of estuarine areas as a means of meeting increasing seafood needs of rising population levels.
5. Confining alkali and other salts in area of origin or controlling their disposition.
6. Watershed control of silt.
7. Control of organic, industrial and radioactive wastes, and domestic sewage.
8. Control of year-round turbidity levels resulting from dredging, gravel operations, etc.
9. Secure adequately trained personnel representative of all interests with ability to understand the overall concept of water resources management to plan and implement water resource development and management programs.

IV. RECOMMENDATIONS

1. Complete implementation of Coordination Act, as amended, to provide for the realistic approach to water resources management.
2. Recognition of the fact that every effort must be made to eliminate any waste of water resources by officials at all levels of government and also by private interests.
3. Provision of adequate time and funds for coordination and studies by fish and wildlife technicians and other interests concurrently with engineering planing groups from the inception of all proposed projects.
4. Recognition that a major problem is the reduction of fish and wildlife habitat as a result of other water developments and the establishment of firm policies to provide for these needs.
5. Allocation of suitable lands and waters for fish, wildlife, and other recreational uses in connection with water resource developments by the inclusion of fish and wildlife as one of the primary functions, even if enhancement is involved.
6. Federal projects costs to include fish and wildlife developments as allied or associated project costs. State share cost by assuming responsibility for operation and maintenance of such developments.
7. Provision by acquisition of adequate public lands associated with water resource developments for public use.

Mr. WIMBERLY. Now, Mr. Chairman, we will pass to the matter of municipal use and health, and I would like to call Mr. John E. Trygg.

Senator ELLENDER. All right, Mr. Trygg. Step forward, please.

STATEMENT OF JOHN E. TRYGG, DIRECTOR, DIVISION OF PUBLIC HEALTH ENGINEERING, STATE OF LOUISIANA

Mr. TRYGG. Senator Ellender and Senator Hart, I am John E. Trygg, director of the Division of Public Health Engineering of the Louisiana State Board of Health.

The State board of health, through its division of public health engineering, has the responsibility for the public health and sanitary aspects of domestic water supplies.

In addition to being the director of the division of public health engineering, I also serve as a representative of the president of the board

of health on the Louisiana Stream Control Commission; however, since the stream control commission has been represented by Mr. Biglane, my presentation will concern itself with matters pertaining to domestic water supplies to include all supplies producing water for human consumption.

Louisiana has an estimated population of 3,190,000. Of this number, approximately 75 percent are served by in excess of 400 municipal type water supplies.

Although a majority of our domestic supplies have ground water sources, a greater number of people are served by surface water supplies than by ground water supplies.

Data available from our major cities indicate water requirements may increase as much as 78 percent in the two decades to 1980. Specifically, a study by consultants to the city of New Orleans indicate a water requirement increase from 1955 average water use of 88 million gallons per day to 157 million gallons per day use in 1975. Estimates from Shreveport indicate an increase of 50 percent by 1980 and in Monroe a 33 percent increase by 1980.

These increases are typical of those anticipated for the cities and towns in our State.

It is significant to note that the water requirements are increasing both because of a rise in population and because of an increase in per capita water use.

The water used in Louisiana for domestic purposes is actually a very small portion of the total water requirement. However, no one would question the importance of that portion. Without water for the population to drink there would be no need for water for other uses. The procurement of this small slice is not as simple as it appears when other water users such as agriculture, industry, and navigation are competing for available sources.

As an example, in certain areas heavy water use by agriculture and industry have appreciably lowered the water table and may have been responsible for salt water intrusion.

I might say the estimated water use at the present time is approximately 300 million gallons per day. In 1980 it probably would be about 450 million gallons per day. I am referring now to the total water use.

The board of health is in continuous touch with the problems of our public and private water supplies. In preparation for this hearing, our larger cities, particularly those using surface water, were contacted in regard to their problems.

The quantity of water available within the State of Louisiana at this time for domestic use is entirely adequate. The problems we have in the State are largely of quality and in certain isolated instances, the adequate distribution of water available to us.

It is easily understandable that we do not have surface water sources which require little if any treatment since we are on the downstream end of a tremendous watershed and we get flow from the large populated agricultural and industrial runoff areas. We do have one northern city which has a very good but limited source of water. I refer specifically to Shreveport. City officials are anticipating problems and have spent much energy and money in planning to solve those problems.

The lower 10 parishes along the Mississippi River use the river as their basic water source; these parishes have a combined population of approximately 975,000 and the total water used from the river is approximately 30 percent of the domestic water requirements of the State.

The Mississippi River in spite of its tremendous flow even at low periods leaves something to be desired as a source of domestic water.

Base lines for the quality of the Mississippi River for past years are not readily available and there is little data for comparison between the river of 50 years ago and the river of today. However, we do know that with the increase of population growth over the United States and the Mississippi Valley there have been tremendous organic loads imposed on the river and even more important there must be very large industrial waste loadings to the river. The latter wastes particularly result in treatment problems. Some wastes are impossible to remove with conventional water treatment facilities, or at best treatment is impracticable. The domestic wastes contributions can be handled with little difficulty if sewage treatment works are provided.

The city of Monroe has experienced troubles with their surface water supply and although the State of Arkansas has taken effective action in removing some of the harmful constituents of the water, it is still a source with much to be desired.

Ground water is available of usable quality in most of the State except the southern portion of the State, particularly the lower Mississippi River parishes where the mineral content is in general too high, particularly chlorides, to be readily usable as domestic sources.

In addition there are certain limited areas throughout the State, particularly the northwest corner of our State where the quantity and quality of ground water is limited and in some instances no surface source is readily available at this time.

The State board of health, with the assistance of the stream control commission and largely helped by the present Public Law 660 is making very rapid progress in the elimination of sewage pollution; and if the current progress stays in effect for the 10-year period originally scheduled, our sewage pollution problems shall be well in hand.

I might state at this time it is our estimate that for every Federal dollar spent under this program under Public Law 660 there are at least five more spent locally.

Also I want to state at this time I have all my money committed, all the money I have at my disposal is already committed for the present year and I could use considerably more.

The stream control commission has been aggressive in their action in the abatement of pollution as well as minimizing new pollution from industrial sources.

It appears that official State agencies have the capability to solve their pollution problems within the State and with the tools at hand.

The problem of pollution from outside sources or that of polluted water entering our State is one that cannot be solved by our State and is one in which we must rely on Federal help.

Public Law 845 and the current 660 gives each State tools for working with the Federal Government in interstate pollution matters; however, our problem in connection with the Mississippi River with

so many States involved is considerably broader than any solved through these media to date.

The present studies being made by the Public Health Service, in conjunction with the States, and I refer specifically to the sampling network, will establish long-needed baselines and also generally establish the sources of pollution far better than any other program thus far.

Expansion of this service, with pressures being brought to bear on offending States would improve the quality of the Mississippi River and other interstate streams and would be of great help.

Another specific field in which Federal Government participation will improve domestic water sources is the field of impoundment, particularly in connection with the upstream drainage areas of the rivers which flow through our State, to equalize flows and to make quality consistent. The Federal assistance should be in connection with projects and work that individual States are not able to do with their own resources.

Our State has done much in this field within our State in conjunction with Federal agencies. In those cases where Federal agencies are involved, the State's requirements in regard to pollution control should be recognized and not subordinated to Federal control, particularly when the latter is less stringent.

Studies such as those currently being carried on by the Department of Interior on desalination of water may solve many problems; individual States would find it difficult if not impossible to carry on such a study.

In summary, at the present time Louisiana's problem in domestic water supplies are not great in comparison with those in some of our other States.

We do have an adequate quantity of water although in some cases we do have distribution problems.

Quality of water is our greatest problem and those problems will probably become greater.

The State is solving its intrastate problems and should be allowed to continue to do so; however, there are interstate problems in water quality in which this State has no control; these problems clearly indicate a need for help by the Federal Government.

Thank you.

Senator ELLENDER. Thank you. Any questions?

All right. Next.

Mr. WIMBERLY. Mr. Chairman, we will now pass to the matter of recreation and I present Mr. W. W. Wells.

Senator ELLENDER. All right, Mr. Wells.

STATEMENT OF W. W. WELLS, ASSISTANT DIRECTOR, STATE PARKS AND RECREATION COMMISSION, STATE OF LOUISIANA

Mr. WELLS. Senator Ellender and Senator Hart, recreational boating, fishing, hunting, swimming, and water skiing are rapidly increasing in popularity. Conflicts as to which group has the preeminent right to use the waters are developing. Even if we had a static population the competition for these various uses is increasing to a large extent each year. Taking into consideration the present

population explosion, the situation becomes one of greater importance in the future which lies ahead.

Louisiana has a total of 12,204 acres in State park land, which is the lowest in the entire South. The ratio of 3.65 acres per thousand population is the lowest in the South. The recognized standard is 30 acres per thousand population for State park lands plus an additional 15 acres per thousand for other nonurban recreational lands located near large population centers.

Thus in State park lands alone, by nationally accepted standards, Louisiana should have 10 times the number of acres in the present park system. To complete the recreational picture 15 times as much land is needed.

Of the 12,204-acre total of park land approximately 2,000 acres comprise the lake at Chicot State Park. Other water areas in the State parks are:

A 3-mile shoreline on Lake Bistineau.
A 10-acre lake and a 4,000-foot shoreline on Bayou Bartholomew in Chemin-A-Haut State Park.
A ½-mile shoreline on Lake Bruin.
A 3-mile shoreline on the West Fork of the Calcasieu River and Indian Bayou in Sam Houston State Park.
A ¼-mile shoreline on Bayou Teche in Longfellow-Evangeline State Park.
400 feet of shoreline on Bayou Lafourche.
A 2½-mile shoreline on Lake Pontchartrain and a 7-acre freshwater lake in Fontainebleau State Park.
A ¼-mile shoreline on the Bogue Falaya River.
1,000 feet of shoreline on the Chef Menteur Pass.
A ½-mile shoreline on the Rigolets Pass.
A ½-mile shoreline on Old River at Marksville Prehistoric Indian Park.

Altogether the above figures make a scanty total of 2,017 acres of water and 11½ miles of shoreline for the entire park system. Although existing conditions vary a great deal, a desirable proportion for State parks would be approximately 1 acre of recreational water to each 3 acres of land area.

There are only 70 acres of National Park Service lands (Chalmette National Historical Park) in the entire State—a figure so small that it averages 0.02 acres per thousand population; a figure too small to be taken into consideration. Nor is there a likelihood that any more lands in Louisiana will be taken into the national park system with the exception of a small addition to Chalmette.

National forest lands in Louisiana total 548,783 acres. A great amount of the land is cut over and not desirable for recreational use except, perhaps, for public hunting grounds. There are no water areas of any extent within these lands. The one State forest area presents a similar situation.

Louisiana has a total of 3,361 square miles of inland waters, counting lakes of 40 acres or over and streams with a width of ⅛ mile or over. There is a total of 1,016 square miles of other waters (coastal bays, and so forth). The major problem from a recreational use standpoint is, first, access and a usable shoreline. The large swamp areas adjacent to much of the water makes it useless for that reason. Secondly, the waters which can be made accessible have no public lands surrounding them. One major problem, then, is the acquisition of large acreages of land for public use on existing waters which are suitable for recreation. Thirdly, the vegetative problem on much

of the water is such as to make it unfit or unusable for recreational purposes.

Fishing, which is of course entirely dependent on available water, and hunting, which also to a large extent depends on adequate waterfowl areas, are recreational activities of great importance in Louisiana. In 1958, 65,566 one-dollar fishing licenses and $27,724 worth of $5 and $7 nonresident licenses were sold, accounting for a total of $192,290; 272,756 one-dollar hunting licenses and $2,866 of nonresident licenses were sold, accounting for $275,622.

FUTURE POPULATION TRENDS

By 1980 there will be an additional 2 million people living in Louisiana, or a total of approximately 5,346,000. A 35-hour workweek may be standard, and there will be a greater proportion of older people. These conditions will influence greatly the amount of recreational lands and waters needed and will affect to a certain extent the type of recreation. For example, there will be a greater proportionate need for more fishing waters, because fishing is an activity indulged in by many older people.

CURRENT STUDIES

Two nationwide studies, the park parkway and recreational area survey recently reactivated by the National Park Service, and the inventory of all nonurban recreational areas by the National Outdoors Recreation Resources Review Commission, will be of invaluable help to the various states in reappraising their recreational area needs. It is understood that, working with the States, recommendation will be made as to how to best fulfill these needs.

FUTURE TRENDS IN RECREATION

The trend which recreation will take for at least the next 20 years is making itself quite evident at the present time. There is a great exodus to the large outdoor areas. Water seems to play the most important part. Boating and other sports dependent on boats such as fishing and water skiing are increasing tremendously. Taking its place beside the second car in the garage is the family boat.

Tent and trailer camping is the other great trend in outdoor recreation. This is especially true in the South where climate and insects no longer seem to present any barriers. The most desired campsites are on or near water. The activities most often indulged in by campers have to do with the recreational use of water. These are nationwide trends making a great impact on every State and on all types of outdoor areas: the national parks and forests, State parks and forests, county parks and private lands.

NEEDS BY THE YEAR 1980

The needs to meet "The Crisis in Outdoor Recreation," which is presented excellently in Marion Clawson's article first published in the American Forests, are very great. So great in fact that it is unrealistic to expect that they can be met by any one agency or by Govern-

ment alone. The Federal Government, the State, cities, counties, or parishes will all have to participate. In addition it will be necessary for the large private landowners to open up their lands and waters for recreational use. This has already been done with success in some parts of the country.

There is also a great need for parish or county governments to recognize their responsibility in providing smaller local areas which are not of statewide significance.

In the future any Federal or State impoundments which are created must also be concerned with their recreational possibilities. This especially is true in Louisiana where at least a dozen and a half State lakes have been created, varying in size from a hundred to 13,800 acres, without acquiring any public lands surrounding them. Governed by various fish and game commissions, mostly inactive, these waters totaling approximately 95,000 acres do very little toward providing the recreational opportunties for which they were created, especially since access is across private lands—and no shoreline ownership is vested in the State.

By 1980, using the formula of a total of 45 acres per thousand people for recreational needs for public lands, a total of 220,570 acres is essential. Of this total at least 73,500 acres should be in water. It is possible that some of this need could be met by better utilization of existing waters where public lands could be acquired. It is recommended that any new State lakes which are constructed should be analyzed and studied, so that their full recreational potential can be realized.

It is recommended that the Federal Government should provide lands and funds for the recreational development along any new Federal reservoirs which may be created in the State. It is believed that more use can be made of existing natural bodies of water.

It is also recommended that a close study be made of the results of the work of the National Outdoor Recreation Resources Review Commission and the park, parkway, and recreational area survey mentioned earlier in this report.

In addition to developed and accessible water recreation areas some sections should be left in their natural wildlife condition and not made available except by boat. There is a vast area of rivers, bayous, lakes, and swamps in Avoyelles Parish east of Marksville, La., which should be preserved and protected by the State or Federal Government, so that it will never be drained, developed, or otherwise destroyed.

Thank you.

Senator ELLENDER. Thank you.

Mr. WIMBERLY. Mr. Chairman, we now pass to power, and I desire to call Mr. F. H. Coughlin.

STATEMENT OF HUGH COUGHLIN, PRESIDENT, CENTRAL LOUISIANA ELECTRIC CO.

Mr. COUGHLIN. Senator Kerr, Senator Ellender, Senator Hart, I note that we are about 2½ hours late and with your permission I will cut this just as very short as I can and rely on the printed statement which has been presented.

My assignment has been to make the projection of the power needs of our State here for the next 20 years for all of the power producers.

There are 21 municipal operations and 6 private companies in that category; no others.

In 1959 our energy requirements were 11 billion kilowatt-hours. By 1970 there will be a threefold increase and by 1980 a 7½-fold increase.

This increase is at a rate of about 50 percent greater than the national average. About 5 percent of that will be municipal and about 95 percent power.

The present energy reserves, capability reserves are 37 percent, which is about three times the amount considered to be normal.

The companies contacted assured this committee that they expected to maintain a very high ratio of reserves in the future.

In projecting the water needs of that contemplated requirement we had to consider the various types of production which might be utilized, thermonuclear, hydro, gas turbines, and so forth, and we concluded that the best thing to do was to rely on the thought that steam turbines, high-efficiency steam turbines, would predominate and we made no recognition in our forecast of any of these others for the following reasons:

In the first place, thermonuclear power today is not thermally efficient and requires a great deal of water. In a few years we expect it will be. As a matter of fact, five of the companies in this group are engaged in at least two privately financed thermonuclear research projects, one of which is directed toward the idea of getting high temperatures and pressures which will let us use the efficiency of our modern-day turbines.

Gas turbines will unquestionably——

The CHAIRMAN. Before you leave thermonuclear, is it your judgment that they will be conservers of water, that you can get the same amount of energy with less water or will it require more?

Mr. COUGHLIN. No, sir. At the present time they require considerably more water than our most efficient steam generator.

The CHAIRMAN. Is there anything in the picture to indicate that situation will be anything different in the future?

Mr. COUGHLIN. We feel so; yes, sir. Five of the companies in the State are engaged with 10 others in research on the advanced epithermal thorum reactor. That is a $10 word.

The CHAIRMAN. It is bigger than that, but then you take it.

Mr. COUGHLIN. We feel that that will give us a very high temperature and consequent pressures which will permit us to use the modern-day steam turbine which gives us an efficiency of course a great deal higher than has been true in the past.

Our present-day optimum steam turbine has an efficiency of 8,900 B.t.u per kilowatt-hour whereas the average is probably around 12,000 or 13,000 B.t.u. But we fully expect that by the time it can be brought into economic use that we will have atomic energy which will be comparable and thermal efficiency with the modern-day fossil fuels.

The CHAIRMAN. With what you now have?

Mr. COUGHLIN. Yes, sir. Therefore, that will make no difference in our projection.

The gas turbine has most of these modern day units, have high load factors, they are reheat units in order to use less water and fuel, they

have high load factors but we are having to provide something for peaking purposes. The gas turbine is ideally suited to that. In our latitude it costs about $120 or $130 a kilowatt. It doesn't have much thermal efficiency but the number of kilowatt-hours involved are not great. And the alternative is hydro for peaking purposes and that is the highest and best use of hydro here but hydro is not material in Louisiana.

There are only four projects that have ever been considered seriously. If we count Toledo Bend, half of Toledo Bend——

The CHAIRMAN. Is that the one on the Sabine River?

Mr. COUGHLIN. That is the one on the Sabine. That will have a capability of about 80 megawatts, half of which is attributable to Louisiana.

The CHAIRMAN. Before you go farther there, I have been trying to keep up with you. Page 3 you estimated the energy requirements of electric power of 1980 as compared with 1959.

Mr. COUGHLIN. Yes, sir.

The CHAIRMAN. Total demand in millions of kilowatt-hours in 1959 is 10,166, projected is 79,958, approximately 7½ times as much.

Mr. COUGHLIN. Yes, sir.

The CHAIRMAN. In 20 years.

Mr. COUGHLIN. Yes, sir.

The CHAIRMAN. Now, do you know how that compares with the estimates made by responsible industrial engineers for the Nation as a whole?

Mr. COUGHLIN. Those figures generally, the group 1 figures will accord with those submitted by the Southwest Power Pool.

The CHAIRMAN. I do not believe you understood my question.

Mr. COUGHLIN. How they compare for the Nation as a whole?

The CHAIRMAN. As to what the Nation's needs will be as related to what their present consumption is.

Mr. COUGHLIN. It will be about four times. It will double every 10 years.

The CHAIRMAN. That is your estimate?

Mr. COUGHLIN. That is the national estimate.

The CHAIRMAN. Every 10 years?

Mr. COUGHLIN. Yes.

The CHAIRMAN. Go ahead.

Mr. COUGHLIN. This is 7½-fold.

The CHAIRMAN. Yes.

Mr. COUGHLIN. This is in accordance with the history of the last 25 years.

The CHAIRMAN. In this area?

Mr. COUGHLIN. In this area, yes, sir.

The CHAIRMAN. I understand. All right. Go ahead. Now, you are back on the bottom of page 4.

Mr. COUGHLIN. Senator, with your permission I will tell you, I was requested to divert from that presentation because it would take too cockeyed long.

The CHAIRMAN. That is all right. You and they figure that out. I am just enjoying every bit of it.

Mr. COUGHLIN. All right, sir. I am willing to go along just as far as you choose.

The CHAIRMAN. I can't.

Mr. COUGHLIN. But going back to the alternative for peaking purposes, the hydro, I mentioned the fact that there are only four units that had ever been seriously concerned. They have been nearly all in the FPC report. If you look at the economics of that, the Toledo Bend Reservoir on the basis of kilowatts alone would cost about $700 per kilowatt as compared to $120 for gas turbine or $100 for steam, so you can see that it is going to take something else, some other need, some other compelling need to make that an economically feasible project and I expect that is the reason we have not had other hydros before.

The total hydro involved for the State would be about 85 megawatts, with only about 205 million kilowatt-hours, which is less than four-tenths of 1 percent of our projected needs.

Now, on those premises, then, we have projected the water requirements from 1959 requirement of 7.2 billion gallons for consumptive requirements to 36 billion in 1980 for consumptive requirements.

The CHAIRMAN. That is the annual requirements?

Mr. COUGHLIN. That is the annual requirements, yes, sir.

The condensing needs or the other beneficial needs, the circulating needs are about 72 billion in 1959 and there will be 15,244 billion in 1980.

Now, it seems to us—the consumptive use incidentally is where it is nine-tenths of 1 percent now and will be only six-tenths of 1 percent in 1980. It seems to us, however, that it is most confusing to include beneficial uses, or to tabulate beneficial uses with mere circulating—with consumptive uses, I should say.

Now, the consumptive uses are about six-tenths of a gallon per kilowatt-hour now and they will be then about four-tenths of a gallon per kilowatt-hour in 1980, a very small percentage of the total.

I might show by illustration, 40 miles from here there is a powerplant in Bayou Cocodrie. With the completion of the unit under construction there now that plant will be utilizing six times the minimum flow of Bayou Cocodrie. That shows how odd you can get in using figures there. That is the reason we feel that they should not be consumptive uses, should be differentiated from the others.

By the same token we might note that the hydroelectric power generation does not consume any of the water that passes through the water wheel. On that basis the same Toledo Bend project would require some—I believe that is 1,500 gallons per kilowatt-hour, 1,500 billion gallons a year, which would be 90 times the circulating water requirements per kilowatt-hour of a steamplant.

Such figures seem to distort the whole picture, the statistics for the purpose of economic evaluation.

The problems of circulating water supplies are not too great in Louisiana. Minimums in Louisiana are most significant and other industries and other people here have testified in the same manner. They can be affected by upstream diversion, evaporation due to structures up there, excess upstream withdrawal, highly variable streamflow, so on and so forth.

Now, so long as there is very little common acceptance of principles recognizing economic use and minimum standards implied in those

limitations, so long as this conflict remains unresolved in principle, the prospective manufacturer or developer can ill afford to invest capital in this precariously unstable situation. That also has been said by other witnesses. It should be emphasized, however, that in our opinion all of these problems dealing as they do with citizens within the State are essentially problems of the State and should be resolved by the State.

It is recognized that the Federal Government must operate as the referee as between States and so forth, so that each gets its proper share. The Federal Government can make a tremendous contribution by developing exactly meaningful statistics, by research. It could organize, promote, and conduct research on water loss or waste, on means of salvaging water, control of precipitation, and on seawater salvage and all of those things, many of which it is doing now.

However, we still lack adequate data for sound estimates. It should see forth principles which would guide all water users so that each may return to the source a reasonably useful product, not unreasonably diminished for the benefit of riparian and other owners. It should certainly act as a referee between the conflicting interests among the states.

Clear, objective, unbiased statements on the part of the Federal Government on all such matters in language that the layman can read and understand can have a tremendous effect in determining the attitudes and performances of competitive interests. Such clear statements could go far toward preventing establishment of practices and misdirected capital investments which can become very difficult to remedy once there has been quiescent acceptance in any degree.

Our preceding witness, the pollution man, referred to that very point. The Federal Government could and should set the very highest standards of conformity with the letter and spirit of the law and its administration of all projects. It should provide an example. It should avoid certain locations and should be the last of the project of dubious economic merit.

Thank you very much.

Senator ELLENDER. Thank you very much, Mr. Coughlin.

Mr. COUGHLIN. Thank you.

Senator ELLENDER. At this point, I would like to submit the report of the power section of the State Coordinating Committee of Louisiana.

STATEMENT SUBMITTED BY HUGH COUGHLIN FOR POWER SECTION OF COORDINATING COMMITTEE FOR LOUISIANA

We consider it a very distinct privilege and honor, as a member of the State coordinating committee, to submit to Senator Kerr's Select Committee on National Water Resources a projection of water needs by central station electric generating facilities in the State of Louisiana.

It is the function of others on this committee to detail the character of the total available water supply. Despite the extraordinarily favorable situation in this respect, the electric-generating industry does have supply problems and possible conflicts of interest with other prospective users which could conceivably become quite serious. The electric-generating industry is usually classified as that requiring the greatest amount of water of any single industry. Such unqualified statements have led to serious misconceptions. It is our purpose, therefore, to project the electric-energy requirements of the State for 1970 and 1980, to describe briefly the character and methods of water utilization by each type of generating facility, to evaluate present consumptive

needs, and to make a projection of consumptive needs for 1970 and 1980. In order to provide for these consumptive needs with optimum water use and a minimum conflict of interest, certain recommendations shall be incorporated herein.

All of the electric-generating facilities within the State, intended to provide service for sale to others, are owned by groups which may be classified as follows for the purpose of this analysis:

Group I. Five privately owned companies whose high-voltage transmission facilities are interconnected and (with others) operate as a power pool (identified, exhibit 1).

Group II. A privately financed system not integrated with others (identified exhibit 2).

Group III. Twenty-one municipal systems (identified exhibit 2).

There are no hydroelectric generating stations in the State; there are no federally owned plants; the rural electric membership associations, which distribute substantial amounts of energy to their membership, have obtained energy at wholesale from the companies in group I above, hence their requirements are included in the projections for those companies. Many industrial plants have their own generating facilities and it is presumed that industry's projection of its overall needs will anticipate the water requirement of its own captive generating facilities. The central station industry projection, identified by the three groups above, does contemplate the water needs for the electric energy which it expects to supply to industry. The location of all facilities of the three groups is shown on the transmission grid system map (exhibit 3).

The projections herein contained are based upon data most graciously supplied by many sources; however, the extrapolations and the modifications dictated by data seemingly in conflict must be construed to be the responsibility of the undersigned.

Electric-energy requirements of Louisiana projected in some detail on exhibits 1 and 2 and are summarized as follows:

TABLE I

	1959		1970		1980	
	Demand (megawatts)	Energy (million kilowatt-hours)	Demand (megawatts)	Energy (million kilowatt-hours)	Demand (megawatts)	Energy (million kilowatt-hours)
Group I	1,796	10,004	5,483	30,564	14,477	77,172
Group II	8	32	20	76	47	179
Group III	178	580	383	1,296	739	2,605
Total	1,982	10,616	5,886	31,936	15,263	79,956

Group accounts for approximately 95 percent of the total.

The generation of electric energy does utilize very substantial quantities of water, but in thermal stations, at least, the consumptive use, that is, accelerated or forced evaporation, is only a very small portion of the total quantity utilized. The consumptive uses are determined by the quality and temperature of the water available, by the prevailing atmospheric conditions—temperature, humidity, wind velocity—by the nature of the water supply, lakes, streams, impounding reservoirs, and sometimes wells, and by the type of thermal station and the manner of utilization therein. Compared to each other, thermal stations of these different types may be said to have widely varying consumptive uses, but the differences are insignificant when compared to the total quantity circulated.

In the most favorable order of consumptive water utilization by electric-generating facilities, there should be listed the following: gas turbines; internal-combustion engines with air-cooled radiators; modern high-thermal efficiency (reheat) units; conventional internal combustion engine plants; present day thermonuclear plants; and, finally, hydroelectric plants. The respective consumptive water demands of each of these types of central stations is set forth in exhibits 4 and 5 attached with explanatory notes. Consumptive water use of these plants ranges from virtually nothing to a possible 26 gallons per kilowatt-hour. Each of the types of plants referred to is presently operating in the State of Louisiana except hydro and nuclear. As a condition precedent to the

evaluation of water demands, it has been necessary to surmise what kinds of plants are most likely to be employed and the degree to which they will be employed.

For the purpose of this projection economic considerations dominated, hence the following assumptions have been accepted:

The gas turbine will be a peaking unit most highly competitive with hydro but the relatively costly kilowatt-hours involved will be negligible;

Hydro is highly speculative. Only four such projects have ever been seriously contemplated. These are identified by FPC P–32 as Farmerville, 2,500 kilowatts; Alabama Landing, 40,000 kilowatts; Mooringsport, 3,000 kilowatts; and Toledo Bend, 80,000 kilowatts of which 40,000 is allocated to Louisiana. The total of 85,500 kilowatts with a generating capability of 280 million kiolwatt-hours, less than 0.4 percent of projected needs, is not significant.

Many municipal operations will gradually exceed the comparative economic capability of internal combustion engines. In such instances small nonreheat steam turbines are projected. Virtually all will utilize cooling towers.

Thermonuclear generation is presently competitive when fuel cost exceeds 54 cents per million B.t.u. (AEC report). Present fuel costs in Louisiana average less than 20 cents and, while rapidly rising, are not apt to reach a competitive figure for several years. In the meantime, it is expected that research will improve the thermal efficiency of nuclear plants so that water needs will not be greater than that of large conventional plants. Each of the group I companies is actively participating in at least two nuclear research projects, one being the wholly privately financed research on an advanced epithermal thorium reactor which holds great promise of attaining that objective. This report, therefore, contemplates no water-need change as a consequence of whatever nuclear fueled stations may be built.

On those premises projections have been made in detail (exhibit 6) showing the consumptive needs for all groups. These are summarized as follows:

TABLE II.—*Projected water consumption by electric utilities, Louisiana*

[Millions of gallons]

	1959	1970	1980
Group I	6,212	14,610	32,412
Group II	0	0	0
Group III	1,025	2,039	3,409
Total	7,237	16,649	35,821

In addition to consumptive needs, a much greater amount of water will be required from lakes, streams, and sea, as set forth in table III, to circulate through the condensers. This is returned to the source of supply unchanged except for the addition of a few degrees of temperature which is quickly dissipated by evaporation, conduction, and radiation. This is the forced evaporation previously defined as a consumptive use. Group I accounts for practically all of the additional water utilized in this manner. Southwest Power Pool has already reported to your committee on such needs for these companies in response to a specific questionnaire submitted to Edison Electric Institute. Exhibit 7 is a copy of the data so supplied. An abstract shows:

TABLE III.—*Cooling water intake for thermal plants, Louisiana*

Group I:	*Billion gallons*
1959	725
1970	2,211
1980	5,244

NOTE.—Group I's consumptive needs, now but 0.9 percent of water circulated will be less than 0.6 percent in 1980.

Incidentally, this bespeaks water economy of the highest order for our State. Since 95 percent of our generating facilities are pooled, marked water economy is realized by the pool's ability to support larger, more efficient units requiring

less water and all participating companies now have base load reheat units. The integrating transmission system is designed to permit the maintenance of these units at load centers, thus reducing transmission losses and accompanying water waste. The pool requires less spinning reserve as well as less actual reserves. The pool permits the utilization of economy power, lowering overall water requirements and, finally, inherent diversity and flexibility provides water economy by diversity factor alone as well as in the pool's ability to utilize water storage surpluses anywhere.

All circulating or condensing water is returned to be reused by others, except for evaporation, with little or no change in its quality. The statistical requirement of reporting all water used including that for circulating cooling purposes does not, as shown, diminish the available water supply by that amount and to add such gross amount to the consumptive water uses of others, greatly distorts all such tabulations. For example, one steam plant in central Louisiana will require exactly six times the minimum flow of Bayou Cocodrie when a unit under construction is completed, yet more units are contemplated. Clearly this is incongruous. Such tabulations are thus reduced to dangerously meaningless statistics yet with an aura of governmental endorsement. A like parallel to such statistical legerdemain would be to require hydroplants to count as wated used all of the water passing through the water wheels operating generators. On that basis, the Sabine River project would be required to report 1231.5 billion gallons of water per year for 205,200,000 kilowatt-hours, a rate per kilowatt-hour about 90 times the projected circulating water requirements of all Louisiana central steam stations.

Certainly the large water circulating needs of the industry must be given rightful consideration with respect to equal claims of any other user. Exactly the same may be said of the hydro needs for generation. In the case of steam, it should be noted from exhibit 4 that any impairment of circulating water supplies from natural lakes and streams will cause resort to some type of cooling device which creates a much greater consumptive demand. A cooling tower will, as projected, result in a net consumptive requirement 50 percent greater than the projected use from stream utilization. Some 5 percent is also added to fuel and capital costs to service additional facilities.

Central stations in Louisiana must be prepared to meet problems hitherto unencountered. Minimum requirements for a thermal plant may be affected by streamflow reduction due to upstream diversion to other wartersheds, to excessive evaporation due to manmade structures to provide for other water utilization, by excessive withdrawals for other utilization, agricultural, industrial, or municipal, and occasionally by pollution resulting from concentration of dissolved salts, excessive increase in alkalinity, acidity, or simple heating of the water. Highly variable streamflow regulation by upstream manipulation can also adversely affect the operation of thermal generating plants.

Conflicts of interest between all water users—irrigation, recreationists, other industry, municipal needs—are all growing more acute, even in Louisiana. As a major water user the electric power industry will inevitably be party to its full share of that conflict. So long as there is little common acceptance of principles recognizing economic use and the minimum standards implied above, so long as these conflicts remain unresolved in principle, the prospective manufacturer or developer can ill afford to invest capital in a precariously unstable situation. It should be emphasized, however, that all of these problems, dealing as they do with citizens within the State, are essentially problems of the State which should be resolved by the State.

The Federal Government can serve in many ways. It can encourage the employment of exactly meaningful statistics with respect to the subject of water resources and needs. Organize, promote, or conduct research where needed to determine much more precisely those factors determinant of water losses and spell them out objectively. Establish principles to guide competitive interests toward the most beneficial and economical use of water. Set forth the principles which should guide each water user, including all Government agencies—Federal, State or local—so that each may return to the source a reasonably useful product, not unreasonably diminished, for the benefit of the public and other riparian owners. The Federal Government could recite and emphasize those minimum conditions of flow, quality, and other conditions which should be maintained as a matter of equity between the diverse interests of prospective users. Clear, objective, unbiased statements on the part of the Federal Government on all such matters, in language the layman can read and under-

stand, can have a tremendous effect in determining the attitudes and the performance of competitive interests. Such clear statements could go far toward preventing establishment of practices and misdirected capital investments which become very difficult to remedy once there has been quiescent acceptance in any degree. The Federal Government could and should set the very highest standards of conformity with the letter and spirit of the law in its administration of all water projects; it should avoid circumlocutions and it should be the last to espouse projects of dubious economic merit.

EXHIBIT 1.—*State of Louisiana capability, load, and energy forecast*

[Capability and loads in megawatts, energy in millions of kilowatt-hours]

	1959	1970	1980
Capability (megawatts):			
Group I:			
Louisiana Power & Light, New Orleans Public Service	1,227	2,906	6,426
Central Louisiana Electric	198	687	2,300
Gulf States Utilities	690	2,329	6,404
Southwestern Electric Power	332	723	1,443
Total, group I	2,447	6,645	16,573
Group II: Peoples Utilities	13	30	52
Group III: Municipal systems	251	424	856
Total capability	2,711	7,099	17,481
Peak loads:			
Group I:			
Louisiana Power & Light, New Orleans Public Service	860	2,367	5,845
Central Louisiana Electric	147	605	2,050
Gulf States Utilities	614	1,927	5,500
Southwestern Electric Power	175	584	1,082
Total, group I	1,796	5,483	14,477
Group II: Peoples Utilities	8	20	47
Group III: Municipal systems	178	383	739
Total peak load	1,982	5,886	15,263
Reserves (capability minus peak load)	729	1,213	2,218
Annual energy (million kilowatt-hours):			
Group I:			
Louisiana Power & Light, New Orleans Public Service	4,671	12,855	31,745
Central Louisiana Electric	665	2,780	9,820
Gulf States Utilities	3,915	12,474	30,855
Southwestern Electric Power	753	2,455	4,752
Total, group I	10,004	30,564	77,172
Group II: Peoples Utilities	32	76	179
Group III: Municipal systems	580	1,296	2,605
Total energy	10,616	31,936	79,956

EXHIBIT 3

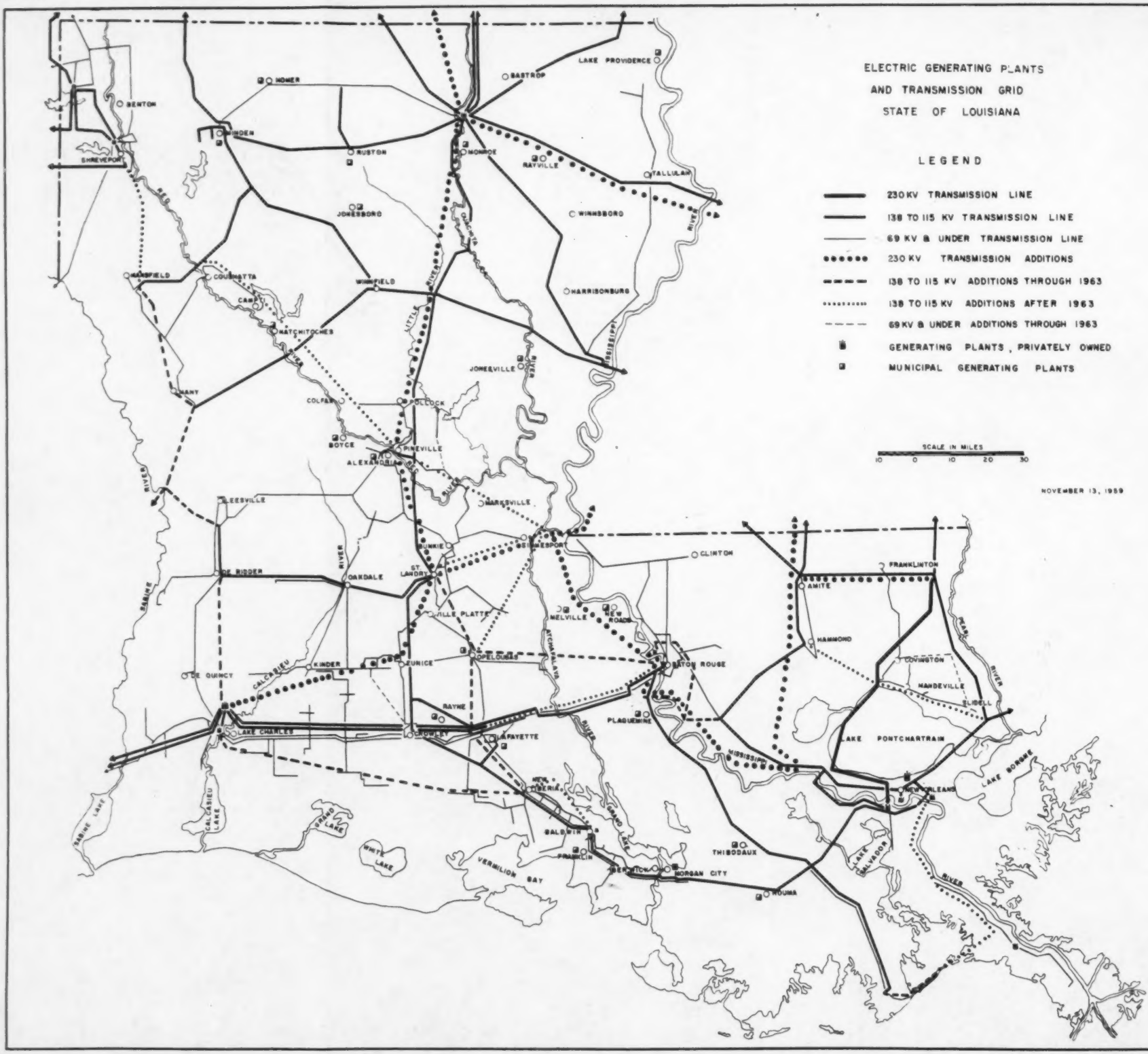
ELECTRIC GENERATING PLANTS
AND TRANSMISSION GRID
STATE OF LOUISIANA
LEGEND
230 KV TRANSMISSION LINE
138 TO 115 KV TRANSMISSION LINE
69 KV & UNDER TRANSMISSION LINE
230 KV TRANSMISSION ADDITIONS
138 TO 115 KV ADDITIONS THROUGH 1963
138 TO 115 KV ADDITIONS AFTER 1963
69 KV & UNDER ADDITIONS THROUGH 1963
GENERATING PLANTS, PRIVATELY OWNED
MUNICIPAL GENERATING PLANTS
SCALE IN MILES
10 0 10 20 30
NOVEMBER 13, 1959
HOMER
BASTROP
LAKE PROVIDENCE
BENTON
MINDEN
RUSTON
MONROE
RAYVILLE
TALLULAH
SHREVEPORT
JONESBORO
WINNSBORO
HARRISONBURG
WINNFIELD
COUSHATTA
CAMPTI
NATCHITOCHES
JONESVILLE
COLFAX
BOYCE
PINEVILLE
ALEXANDRIA
LEESVILLE
MARKSVILLE
DE RIDDER
OAKDALE
ST. LANDRY
OPELOUSAS
MELVILLE
NEW ROADS
CLINTON
FRANKLINTON
AMITE
HAMMOND
COVINGTON
MANDEVILLE
SLIDELL
DE QUINCY
KINDER
EUNICE
BATON ROUGE
RAYNE
LAKE CHARLES
LAFAYETTE
PLAQUEMINE
LAKE PONTCHARTRAIN
NEW ORLEANS
LAKE BORGNE
NEW IBERIA
FRANKLIN
MORGAN CITY
THIBODAUX
HOUMA
VERMILION BAY
SABINE LAKE
CALCASIEU LAKE
WHITE LAKE
GRAND LAKE
LAKE SALVADOR
RED RIVER
SABINE RIVER
CALCASIEU RIVER
OUACHITA RIVER
LITTLE RIVER
MISSISSIPPI RIVER
ATCHAFALAYA RIVER
PEARL RIVER

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EXHIBIT 2.—*Capabilities and load forecast municipal systems and Peoples Utilities, Inc.*

Location	Capability (kilowatts)			Peak load, kilowatts net (summer)			Annual energy, megawatt-hours per year (net)		
	1959	1970	1980	1959	1970	1980	1959	1970	1980
Group III:									
Jonesville	1,200	2,000	3,000	1,048	1,700	2,500	3,576	5,700	8,400
Minden	9,877	15,000	30,000	6,484	12,600	22,700	20,370	40,000	72,000
Rayville	4,866	6,000	8,000	3,120	5,472	7,354	8,730	15,390	20,684
Boyce	700	700	1,000	341	540	800	1,251	2,000	3,000
Alexandria	54,000	80,000	160,000	31,960	72,700	145,000	106,680	265,000	561,000
Franklin	5,500	10,000	20,000	4,602	9,000	16,200	14,940	29,300	52,700
Homer	3,150	6,000	7,000	2,633	4,200	6,200	8,983	14,200	21,000
Houma	17,500	25,000	35,000	12,919	21,210	30,300	42,195	70,000	100,000
Jonesboro	3,000	8,000	20,000	2,545	7,440	18,950	8,103	23,820	60,650
Lafayette	47,600	80,000	160,000	30,080	72,000	145,000	101,760	260,000	550,000
Lake Providence	3,350	9,000	20,000	2,925	8,665	15,932	8,730	25,995	47,796
Melville	1,047	1,600	4,600	517	1,480	3,830	1,432	4,178	10,840
Monroe	44,500	80,000	155,000	33,840	72,700	145,000	102,720	240,000	540,000
Morgan City	7,500	20,000	45,000	7,313	17,600	37,000	25,055	63,300	134,000
Natchitoches	9,890	10,000	17,100	6,435	9,700	13,800	16,684	31,000	47,100
New Roads	5,585	7,000	14,000	3,063	5,965	10,680	8,381	16,400	29,370
Opelousas	7,060	13,800	24,000	8,970	16,800	29,300	30,257	51,113	80,140
Plaquemine	3,000	8,000	16,000	2,584	6,250	14,500	8,245	20,000	46,500
Rayne	4,350	12,000	26,000	4,193	10,500	24,500	13,871	33,700	78,400
Ruston	10,000	18,000	30,000	7,750	16,800	29,300	30,257	51,113	80,140
Thibodaux	7,500	12,000	20,000	5,363	10,500	18,900	17,460	34,200	61,600
Total municipals	251,175	424,100	815,700	178,685	383,822	737,746	579,680	1,296,409	2,605,320
Group II: Peoples Utilities, Inc	13,450	29,950	52,000	8,400	20,000	47,000	31,900	76,000	179,000

EXHIBIT 4.—*Consumptive uses of water, electric generating statistics, by type of plant—Louisiana*

[Gallons per net kilowatt-hours]

	1959	1970	1980
Power pool:			
Thermal stations:			
Lakes, rivers [1]	0.600	0.455	0.400
Cooling towers [1]	.830	.700	.620
Weighted average, present ratio	.621	.478	.420
Isolated system (Peoples Utilities, Inc.): Internal combustion, closed system, atmospheric cooling	[2]	[2]	[2]
Municipal:			
Cooling tower station:			
Internal combustion engines, closed system atmospheric cooling	2.230	2.230	2.230
Thermal stations, mechanical draft, open system	1.420	1.340	1.200
Gas turbine (evaporative cooler) [3]	.059	.059	.059
Hydroelectric, Sabine [4]	25.700	25.700	25.700

[1] Trend is based upon current data applied to projected heat rate (exhibit 5). Some authorities assert that cooling of discharged heated water also takes place by conduction to ground and water and also by radiation, especially at night. The sum of these factors, here ignored, reduces the figures tabulated by one third.

[2] Usage as reported to writer.

[3] The gas turbine uses very little water. This type of unit is coming into increasing prominence for peaking purposes because of its low cost. However, its thermal efficiency is not such, as yet, to warrant its use in competition with more conventional types. It should be recognized, however, that improvement in heat tolerance of metals which, while also reacting to the advantage of conventional steam turbines, could, reasonably, change the relative position of gas turbines insofar as economic use is concerned. Foreseeable use for peaking purposes will not greatly affect consumptive water use.

[4] Forrest & Cotton have estimated that the Toledo Bend Reservoir on the Sabine River, with an impounding reservoir of 181,600 acres, will have a net evaporation of 0.089 feet per year. Generation is estimated at 205,200,000 kilowatt-hours per year, hence natural water evaporation (consumptive use) would be 25.7 gallons per kilowatt-hour.

EXHIBIT 5

AVERAGE BTU/NET KWH STATE OF LOUISIANA FOR THE ELECTRIC UTILITY INDUSTRY

EXHIBIT 5

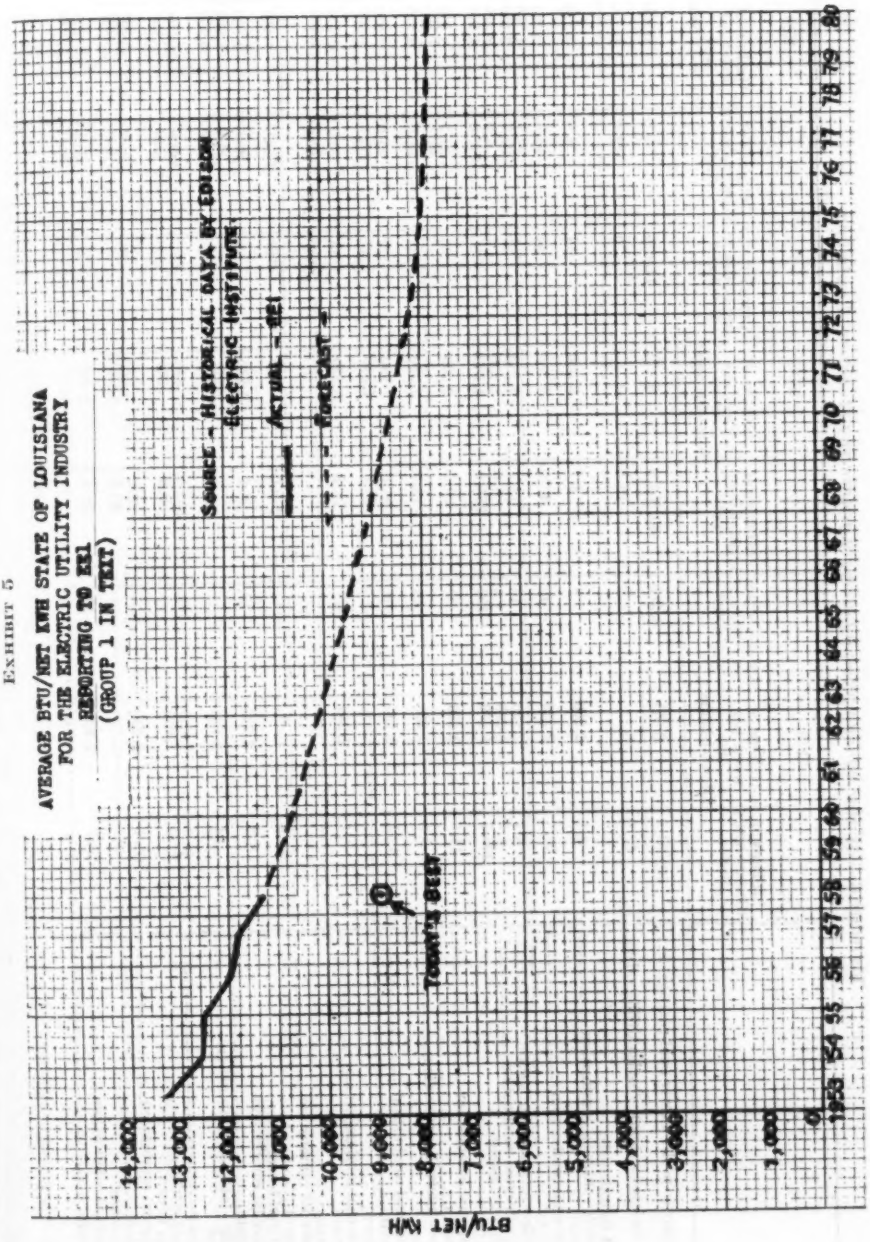

AVERAGE BTU/NET KWH STATE OF LOUISIANA
FOR THE ELECTRIC UTILITY INDUSTRY
REPORTING TO EEI
(GROUP 1 IN TEXT)
SOURCE - HISTORICAL DATA BY EDISON ELECTRIC INSTITUTE
ACTUAL - EEI
FORECAST
TOWN'S BEER
BTU/NET KWH
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1953 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

EXHIBIT 6.—*Water consumption by electric generating stations—Louisiana*

	1959			1970			1980		
	Millions of kilowatt-hours (net)	Gallons of water per net kilowatt-hours	Annual water use (millions of gallons)	Millions of kilowatt-hours (net)	Gallons of water per net kilowatt-hours	Annual water use (millions of gallons)	Millions of kilowatt-hours (net)	Gallons of water per net kilowatt-hours	Annual water use (millions of gallons)
Group I (power pool): Power pool companies	10,004.0	0.621	6,212	30,564.0	0.478	14,610	77,172.0	0.420	32,412
Group II (isolated system): Peoples Utilities, Inc.	32.0	0	0	76.0	0	0	179.0	0	0
Group III (municipal):									
Jonesville—internal combustion	3.6	2.230	8	5.7	2.230	13	8.4	2.230	19
Minden:									
Internal combustion	20.4	2.230	45	40.0	2.230	89	12.0	2.230	27
Steam							60.0	1.200	72
Rayville—internal combustion	8.7	2.230	19	15.4	2.230	34	20.7	2.230	46
Boyce—internal combustion	1.3	2.230	3	2.0	2.230	4	3.0	2.230	7
Alexandria—steam	106.7	1.420	152	265.0	1.340	355	561.0	1.200	673
Franklin:									
Internal combustion	14.9	2.230	33	29.3	2.230	65	26.7	2.230	60
Steam							26.0	1.200	31
Homer—internal combustion	9.0	2.230	20	14.2	2.230	32	21.0	2.230	47
Houma:									
Internal combustion	42.2	2.230	94	35.0	2.230	78	30.0	2.230	67
Steam				35.0	1.340	47	70.0	1.200	84
Jonesboro:									
Internal combustion	8.1	2.230	18	23.8	2.230	53	20.7	2.230	46
Steam							40.0	1.200	48
Lafayette:									
Internal combustion									
Steam	101.8	1.420	145	260.0	1.340	348	550.0	1.200	660
Lake Providence:									
Internal combustion	8.7	2.230	19	26.0	2.230	58	17.8	2.230	40
Steam							30.0	1.200	36
Melville—internal combustion	1.4	2.230	3	4.2	2.230	9	10.8	2.230	24
Monroe:									
Steam	90.7	1.420	129	180.0	1.340	241	480.0	1.200	576
Gas turbine	12.0	.059	1	60.0	.059	4	60.0	.059	4
Morgan City:									
Internal combustion	25.1	2.230	56	23.3	2.230	52	24.0	2.230	54
Steam				40.0	1.340	54	110.0	1.200	132
Natchitoches:									
Internal combustion	16.7	2.230	37	31.0	2.230	69	17.1	2.230	38
Steam							30.0	1.200	36
New Roads—internal combustion	8.4	2.230	19	16.4	2.230	37	29.4	2.230	66
Opelousas:									
Internal combustion	30.3	2.230	68	51.1	2.230	114	20.1	2.230	45

New Roads—internal combustion	8.4	2.230	19	16.4	2.230	37	29.4	2.230	66
Opelousas:									
Internal combustion	30.3	2.230	68	51.1	2.230	114	20.1	2.230	45
Steam							60.0	1.200	72
Plaquemine:									
Internal combustion	8.2	2.230	18	20.0	2.230	45	16.5	2.230	37
Steam							30.0	1.200	36
Rayne:									
Internal combustion	13.9	2.230	31	33.7	2.230	75	18.4	2.230	41
Steam							60.0	1.200	72
Ruston:									
Internal combustion	30.3	2.230	68	21.1	2.230	47	10.1	2.230	2
Steam				30.0	1.340	40	70.0	1.200	84
Thibodaux:									
Internal combustion	17.5	2.230	39	34.2	2.230	76	31.6	2.230	70
Steam							30.0	1.200	36
Total, group III			1,025			2,039			3,409
Total, all groups			7,237			16,649			35,821

EXHIBIT 7.—*Southwest power pool and associated companies—Cooling water sources and annual intake for thermal plants, 1959, 1970, and 1980*

Company	Drainage area	Number of units	Rivers		Lakes		Sea water, etc.		Cooling towers		
			Number of units	Billions of gallons intake	Number of units	Billions of gallons intake	Number of units	Billions of gallons intake	Number of units	Billions of gallons	
										Intake	Makeup
A. Requirements of units existing Dec. 31, 1958–1959:											
Southwestern Electric Power Co	Arkansas-White-Red	10			10	102					
Central Louisiana Electric Co	do	6	6	45							
Gulf States Utilities Co	Lower Mississippi	10	10	100							
Do	West Gulf	4							4	80	0.8
Louisiana Power & Light and New Orleans Public Service Industry.	Lower Mississippi	21	16	265			5	133			
Total 1959		51	32	410	10	102	5	133	4	80	.8
B. Units installed 1959–70:											
Southwestern Electric Power Co	Arkansas-White-Red	6			6	294					
Central Louisiana Electric Co	do	3	3	100							
Do	Lower Mississippi	1	1	30							
Gulf States Utilities Co	do	4	4	282							
Do	West Gulf	3							3	205	4.0
Louisiana Power & Light and New Orleans Public Service Industry.	Lower Mississippi	6	4	385			2	190			
Total installed 1959–70		23	12	797	6	294	2	190	3	205	4.0
C. Requirements of units operating 1970 (A+B):											
Southwestern Electric Power Co	Arkansas-White-Red	16			16	396					
Central Louisiana Electric Co	do	9	9	145							
Do	Lower Mississippi	1	1	30							
Gulf States Utilities Co	do	14	14	382							
Do	do	7								285	4.8
Louisiana Power & Light and New Orleans Public Service Industry:	do	27	20	650			7	323	7		
Total 1970		74	44	1,207	16	396	7	323	7	285	4.8
D. Units installed 1971–80:											
Southwestern Electric Power Co	Arkansas-White-Red	6			6	462					
Central Louisiana Electric Co	do	2	2	60							
Do	Lower Mississippi	7	7	336							
Gulf States Utilities Co	do	6	6	574							
Do	West Gulf	5							5	483	8.0
Louisiana Power & Light and New	Lower Mississippi	8	5	709			3	409			

Gulf States Utilities Co.	do	6	6	574								
Do	West Gulf	5								5	483	8.0
Louisiana Power & Light and New Orleans Public Service Industry.	Lower Mississippi	8	5	709			3	409				
Total installed 1971–80		34	20	1,679	6	462	3	409	5	483	8.0	
E. Requirements of units operating 1980 (C+D):												
Southwestern Electric Power Co.	Arkansas-White-Red	22			22	858						
Do	do	11	11	205								
Central Louisiana Electric Co.	Lower Mississippi	8	8	366								
Do	do	20	20	956								
Gulf States Utilities Co.	do	12							12	768	12.8	
Do	West Gulf	35	25	1,359			10	732				
Louisiana Power & Light and New Orleans Public Service Industry.	Lower Mississippi											
Total 1980		108	64	2,886	22	858	10	732	12	768	12.8	

Source: "Report to EEI Task Force on Power Capacity and Pooling," dated Sept. 30, 1959.

Mr. WIMBERLY. Mr. Chairman, this brings us down to agriculture and forestry. This department is indebted to Dr. Efson, dean of the college. I would like to call Mr. Richard Thompson, president of the Louisiana Soil Conservation District Supervisors.

STATEMENT OF RICHARD THOMPSON, PRESIDENT, LOUISIANA SOIL CONSERVATION DISTRICT SUPERVISORS; AND DON HINTON, MEMBER

Mr. THOMPSON. Mr. Chairman, Senator Ellender, Representative McSweeney, I am Richard Thompson, president of the Louisiana Soil Conservation District Supervisors.

Mr. Don Hinton, who is also with me, is a member of the soil conservation committee and to save time we will present joint testimony.

Our association has known for years the importance of water to all. We have two publications that our association has published over the past years. In 1957 we had one and we just got one off the press, of which you will get the first copy. I will get it to you as Mr. Hinton presents our joint testimony. John.

Mr. HINTON. Members of the committee, I am Don Hinton, a dairyman from Minden, La. I am a member of the State conservation committee. As Mr. Thompson told you, we are presenting our statement together.

Soil conservation district supervisors have emphasized for some time that water control and conservation cannot be separated from soil conservation.

The tremendous increase in the population of the United States predicted by 1980 will change America, particularly in regard to the demand for food, fiber, hard goods, and services. For example, we will need 16 million more quarts of milk than is now being produced. To increase yields of all our agricultural products requires more water, and the average home is requiring more water each year.

We all realize that water, like soil, is limited; except for negligible amounts, the water supply remains constant. Therefore the problem is not creating more water so much as conserving and making more effective use of what we now have.

About 90 percent of the water that flows through Louisiana originates outside of the State. During average flow 65 times more water passes down the Mississippi River each day than is used in the State.

The big problem we face, therefore, is not so much the total amount but rather that we have too much in one place and not enough in another. Too much water at the wrong time is just as serious as too little. During the flood of 1953 there were 12 lives lost and $35 million in damage within a 60-day period. Then, on the other hand, draughts in 1954 and 1955 caused millions of dollars loss to agriculture.

Although Louisiana and neighboring States probably will experience considerable industrial expansion in the years ahead, with some net increase in population, the State and area will remain an important agricultural region. This, of course, will have considerable bearing upon need for and use of both land and water resources.

The U.S. Department of Agriculture is nearing completion of the soil and water conservation needs inventory throughout the United

States. This study has not been finished. However, in Louisiana alone, the local committees have recognized the need for the following; flood-water protection on a little over 4 million acres; drainage on almost 5 million acres; irrigation, 600,000 acres, fish and wildlife development on 70,000 acres; and numerous needs for municipal, industrial, and recreational water supply.

According to these estimates, nearly half the lands in Louisiana have some type of water problem.

A good example of the type problems we have is in the Bayou Bartholomew watershed. This watershed drains from Arkansas into Louisiana. At certain times lands along the streams are flooded, and at other times very little water is available for use. One group wants flood protection; another group wants water stored for irrigation; the city of Monroe is interested in municipal water; and some small industrial plants are in need of additional water. One small town wants water for navigation, and there is a clamor throughout the area for recreational and fish and wildlife reservoirs.

All of these demands for use of the water in this stream have developed in the last 5 years. Through effective planning, all of these uses can be coordinated and the desires of each satisfied. This same problem has been encountered on the Bayou Boeuf watershed. The local people submitted an application under Public Law 566 for irrigation. A study revealed that even though there was sufficient water during normal times for irrigation purposes, during critical periods there was not sufficient flow in the stream to irrigate all of the land. This pointed up the problems with not only supply but water rights.

More than half the estimated $1.2 billion average annual floodwater and sediment damage occurs on small headwater streams and small tributaries. About seven-tenths of this upstream damage is agricultural, including loss to crops, pasture, and damage to farm property such as road, stored crops, fences, and livestock.

Sediment damage to the Nation's 10,000 storage reservoirs, other than farm ponds, results mainly from soil erosion on small watersheds. The average loss to the Nation's water storage reservoirs by sediment is estimated to be 350,000 acre-feet annually. This is brought about by unprotected land in the watershed.

We must recognize our water problems, and make plans for solving these problems. It is our feeling that the upstream watershed protection program administered by the Soil Conservation Service, can be of considerable help in supplying the water at the time and place of need.

This program working in conjunction with our regular soil conservation district program, is an ideal approach to protecting our soil, and at the same time, managing our water resources to meet that will surely increase as the population and demand for food increases.

It is imperative that Federal, State, and local interests plan for water use and water rights policy that will facilitate the orderly development use, conservation, and protection of water resources in every State.

Public Law 566, as amended, creates the opportunity for fully utilizing the soil and water resources on a watershed basis. It is a program initiated and developed by local people, yet requiring State

and Federal participation. Many States have not given enough consideration to water use and water rights policy.

We in Louisiana have the framework to carry out an effective program for solving many of our water resources problems. In addition to work done by soil conservation districts and the Soil Conservation Service, we have a State agency in the department of public works that has done a lot of work on drainage, irrigation, and other phases of water management. This agency has full authority to cooperate with both local and Federal agencies in developing a coordinated approach to management of our soil and water resources.

Soil conservation districts, parish governing bodies, and special purpose districts are sponsoring watershed protection programs and the State department of public works is participating in all the projects now in operation under Public Law 566 in Louisiana. The legislature has recently declared water policy in regard to the surface water of the State, and a commission has been given the task of determining how this policy can best be implemented in Louisiana. Mr. Thompson, who is president of our State association is a member of that commission. Since water does not respect any State or political boundaries the Federal Government must take an active part in meeting the future demands for our water needs.

Since 83 percent of the water supply comes from surface water, land use is a definite key to conserving water resources. Whether the water enters the ground or runs off overland depends largely upon the nature and condition of the soil and its vegetative cover.

Land use has greatly changed the flow characteristics of many streams. Poor conservation farming increases surface runoff during rains.

Total annual streamflow from large river basins is little changed by land use. But the timing, size of peak flows, and the portions of streamflow derived from surface runoff and from ground water may be greatly altered.

Therefore, through proper land use, water shortage during dry seasons, and flood hazards during wet seasons can be materially reduced.

This is why soil conservation district supervisors have emphasized that water control and conservation cannot be separated from soil conservation.

Soil conservation will help control floods and regulate streamflow by using the soil as a vast storage basin and go a long way toward solving some of our problems. However, this will not do the complete job. Farm and ranch conservation measures often need to be supplemented by small dams, and other structures that will handle flows of water too large for farmland practices to handle. This type of program should be expanded from both National and State levels. Research should be speeded up in soil and water conservation activities to insure a sound approach to meeting the demands that have already been outlined. Thank you.

Senator ELLENDER. Thank you very much. Next.

Mr. WIMBERLY. Mr. Chairman, we would like to interrupt the testimony insofar as agriculture and forestry at this time.

With your permission we call Mr. H. K. Thatcher, executive vice president, Ouachita River Valley Association.

STATEMENT OF H. K. THATCHER, EXECUTIVE VICE PRESIDENT, OUACHITA RIVER VALLEY ASSOCIATION

Mr. THATCHER. Mr. Chairman, Senator Ellender, we are glad you got Senator Kerr to come down in this part of God's country to study our water problems.

My name is H. K. Thatcher and I have headquarters in Camden, Ark. Our Ouachita River Basin covers 25,000 square miles and contains about 1 million people. I have prepared a statement which I am handing in for the record. I think it is a very comprehensive statement and written in simple language.

The CHAIRMAN. Do you endorse it?

Mr. THATCHER. I endorse it. The Ouachita River Basin has a growing economy. We are very proud of the fact that over the past 7 or 8 years, or 9 years, in fact, we have averaged $75,600,000 annually in new plants and industrial facilities.

We are trying to get our 6½-foot navigation channel made into a 9-foot channel and with the help of the present committee and others we are going to get that done.

We have a very fine rainfall in the basin and have approximately 20 million acre-foot runoff every year and it is that runoff that we are trying to conserve and to utilize for the future.

We have a water policy in the Ouachita River Valley and I am awfully glad to see that the national water policy has come along and going to incorporate some of these things, I believe, we have had in our policy, Senator.

One of the things that we are trying to do is to conserve as much of the water that is runoff as possible and to do that we have to do it through the construction of dams wherever dams can be located. And we have consistently sought out places where those dams could be built and we are encouraging the Engineers to go along with us and make recommendations as rapidly as they can get around to them.

We have one that is just under construction now, beginning construction, and one that we will write up for authorization, and we have some 10 or 12 other sites located that we hope can be used when the necessity demands the water.

One of the things we are particularly concerned with is the pollution of our water. We know full well that unless we can leave our waters in such shape that the other fellow can use them on downstream that we have not done the job successfully and that is one of the policies and pretty thoroughly covered in the report which I have given you.

We know that we must rely pretty largely on surface water that is going to fall from the skies. We have ground water and a lot of ground water, ground water in practically all of the basin. But I believe our geologists are a little bit liberal in their thinking of the quantity of ground water. At least their thought conflicts to some extent with the industries.

Since my report has been written and submitted to a great many of the industries of our area they have all said that "you are too liberal in the amount of water that you say is in the ground."

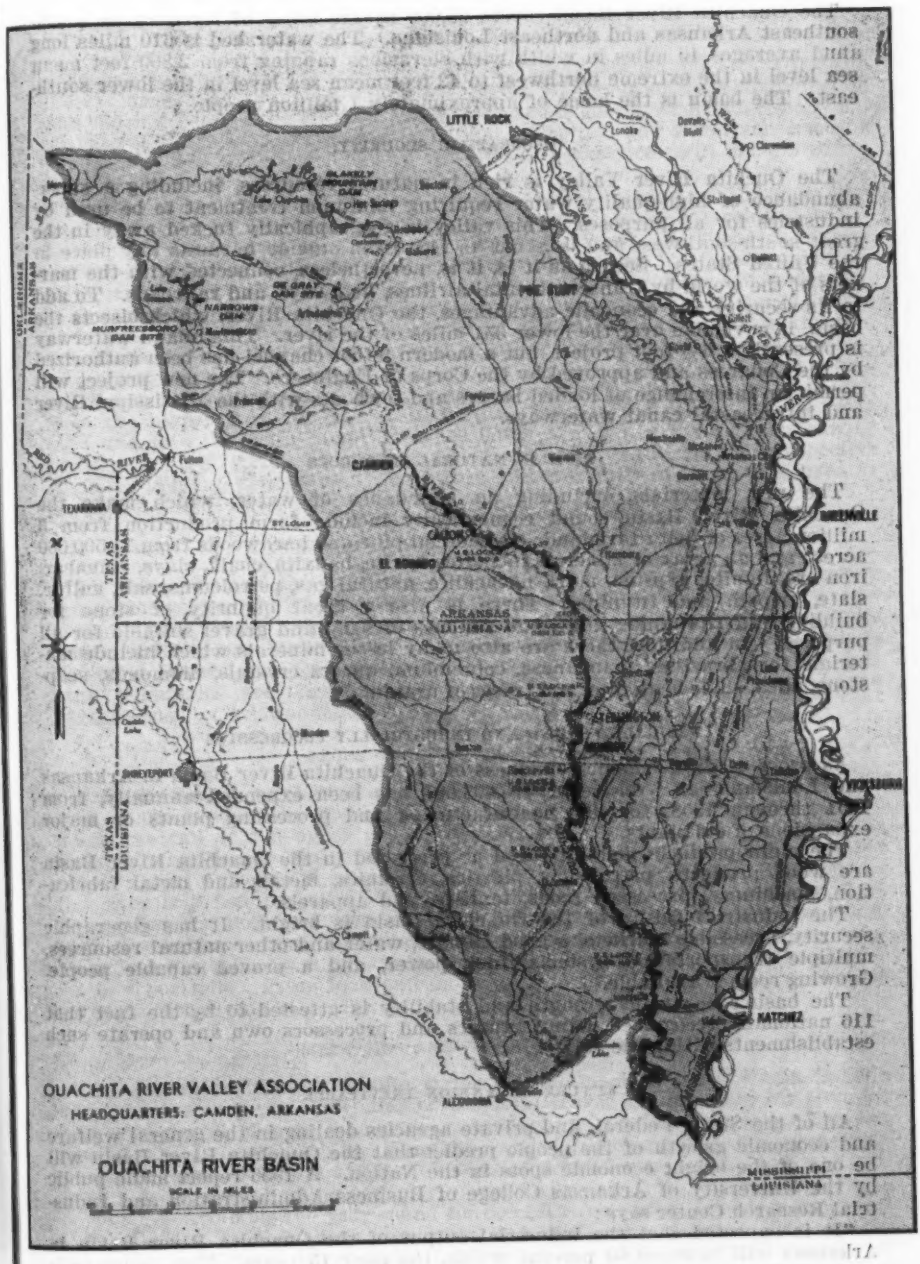
We are going to have to look into surface water in the future. If we do that certainly we are going to have to have controlling dams or water dams to control water.

This is strictly true from the area of Crossett and Eldorado and Sterlington and West Monroe. Those particular people, particular areas, have said that our ground water is not sufficient for what they need in the future.

I think, Senators, that that is about all I should say. I have to hurry away from here. I appreciate the opportunity of coming here, being with you and certainly commend the idea that you are going ahead and going to give us a national water policy. We have to have water or we do not live.

Thank you very much.

Senator ELLENDER. Thank you.


LITTLE ROCK
BLAKELY MOUNTAIN DAM
NARROWS DAM
DE GRAY DAM SITE
MURFREESBORO DAM SITE
PRE BURT
CAMDEN
EL DORADO
TEXARKANA
TEXAS
ARKANSAS
ARKANSAS
LOUISIANA
TEXAS
LOUISIANA
SHREVEPORT
VICKSBURG
NATCHEZ
ALEXANDRIA
MISSISSIPPI
LOUISIANA
OUACHITA RIVER VALLEY ASSOCIATION
HEADQUARTERS: CAMDEN, ARKANSAS
OUACHITA RIVER BASIN
SCALE IN MILES

STATEMENT BY OUACHITA RIVER VALLEY ASSOCIATION

H. K. THATCHER, EXECUTIVE VICE PRESIDENT

The Ouachita River Basin covers 25,000 square miles of territory in south-southeast Arkansas and northeast Louisiana. The watershed is 610 miles long annd averages 40 miles in width with elevations ranging from 2,800 feet mean sea level in the extreme northwest to 42 feet mean sea level in the lower southeast. The basin is the home of approximately 1 million people.

GEOGRAPHIC SECURITY

The Ouchita River Valley is rich in natural resources, including a superabundance of high-quality water requiring minimum treatment to be used by industries for all purposes. This valley is geographically tucked away in the great south-southwest and is about as free from outside harm as any place in the United States. Secure as it is, it is, nevertheless, connected with the markets of the world by transcontinental airlines, highways, and railroads. To add to its security and economic advantages, the Ouachita River, which bisects the basin, is navigable over the lower 351 miles of the river. This inland waterway is presently a 6½-foot project, but a modern 9-foot channel has been authorized by the Congress and approved by the Corps of Engineers. The new project will permit an interchange of loaded barges and towboats with the Mississippi River and intracoastal canal waterways.

RICH IN NATURAL RESOURCES

The raw materials, including an abundance of water, which make the Ouachita River Basin sound economically include farm production from 3 million acres of delta farmland; commercial pine and hardwoods from 11,500,000 acres; and an array of minerals including barite, bauxite, chalk, clays, cinnabar, iron ore, lignite, gypsum, marl, novaculite, natural gas, petroleums, salt, sulfur, slate, tripoli, and titanium. There is also a great quantity of stone for building and riprapping and large volumes of sand and gravel suitable for all purposes. In addition, there are also many lesser minerals which include materials for abrasives, manganese, columbium, quartz crystals, diamonds, soapstone, mica, shale bentonite, and traces of uranium.

BASICALLY SOUND AND INDUSTRIALLY PROGRESSIVE

As proof of the economic soundness of the Ouachita River Basin in Arkansas and Louisiana, an average of $75,603,097 has been expended annually, from 1951 through 1958, for new manufacturing and processing plants or major expansions of old plants.

The main products manufactured or processed in the Ouachita River Basin are wood products, petroleums, plastics, ceramics, metals and metal fabrication, machinery, processed foods, textiles, and apparels.

The industrial future of the Ouachita Basin is bright. It has geographic security, accessible markets, a good climate, water and other natural resources, multiple transportation systems, fuel, power, and a proven capable people. Growing room is available.

The basin's economic strength and stability is attested to by the fact that 116 nationally recognized manufacturers and processors own and operate such establishments within the valley.

FUTURE EXPANSION INEVITABLE

All of the State, Federal, and private agencies dealing in the general welfare and economic growth of the people predict that the Ouachita River Basin will be one of the bright economic spots in the Nation. A 1956 report made public by the University of Arkansas College of Business Administration and Industrial Research Center says:

"It is expected that the industrial output of the Ouachita River Basin in Arkansas will increase 60 percent within the next 15 years. This estimate is made on the assumption that a high level of national prosperity will continue; that major expansions will occur in paper, chemicals, aluminum, and petrochemical industries; and that present economic trends will continue upward.

With improved navigation on the Ouachita River, the rate of growth will be even greater."

This same type of statement has been made by the Louisiana Department of Commerce in some of that department's published reports.

WATER LIMITING FACTOR BUT FUTURE CAN BE ASSURED

Water or the lack of water has limited and controlled man's civilization efforts throughout the ages. Where rainfall was reasonably abundant and man did not control the surplus water, he lost his fertile land by erosion, and his cultural gains of the times went with it. The soil and water conservation policies that are being developed by the present generations will not allow this to happen in the Ouachita River Basin.

The Ouachita River Basin has an average annual rainfall of 51 inches over the entire valley. Thirty-seven inches of this average annual rainfall is absorbed into the ground for use of growing crops, trees, and livestock, except for a relatively small amount that is caught and stored for future use in 10 major reservoirs and navigation pools in the valley. Projects are underway, or in the planning stage, to capture and hold a larger portion of the 14 inches of annual rainfall that now escapes out of the valley on its way to the sea. This basin is one of the best watered areas of its size in the United States; and it is the aim of the people to keep it that way and, if possible, make it better.

The general topography of the Ouachita River watershed, ranging as it does from the higher Ouachita Mountain Plateau through the rolling coastal plain hills and into the delta lands, provides many places where reservoirs can be built to control water. A systematic search and cataloging of prospective damsites is being carried on. The future will see many of these sites used as the need for more water reservoirs becomes economically justified.

RIVERS MAIN SOURCE OF SURFACE WATERS

The main stem of the Ouachita River, with its clear and clean mountain runoff waters, and the 10 tributaries are the principal sources of surface waters in the basin. From south to north, the five right bank tributaries of the Ouachita River are Little River, Bayou De Arboune, Smackover Creek, Little Missouri River and Caddo River. From south to north, the five left bank tributaries are Tensas-Bayou Macon, Big Creek, Boeuf River, Bayou Bartholomew, and Saline River.

SLOPE OF THE OUACHITA RIVER

From its source, at the top of Rich Mountain in Polk County, Ark., to Mount Pine at the base of the Blakely Mount Dam, a distance of approximately 130 miles, the fall of the upper Ouachita River averages about 19 feet per mile. From Mount Pine to Malvern, a distance of 30 miles, the fall is 4.5 feet per mile. From Malvern, at mile 450, to Arkadelphia, at mile 415, the slope of the river is 2 feet per mile. From Arkadelphia to Camden, a distance of 65 river miles, the slope is 1 foot per mile. Below Camden to lock and dam No. 6, near the Arkansas-Louisiana State line, the river slope is 0.3 foot per mile. From lock and dam No. 6 to lock and dam No. 2, near Columbia, La., the slope is 0.2 foot per mile. From lock and dam No. 2 to the Atchafalaya, the slope is only 0.05 foot per mile.

RESERVOIRS AND NAVIGATION POOLS

The superabundance of usable water in the Ouachita River Basin is indicated by the fact that 410 miles of the total length of the Ouachita River is part and parcel of nine man-made reservoirs and navigation pools. The reservoirs are Lakes Ouachita, Hamilton, and Catherine. And the navigation pools are Nos. 2, 3, 4, 5, 6, and 8. (Pools Nos. 1 and 7 were never built.) These have a total water-holding capacity of approximately 2,556,000 acre-feet, much of which is available the year round for domestic, municipal, and industrial use.

In addition to the above reservoirs and pools, the Narrows Dam on the upper Little Missouri River forms Lake Greeson, which has a total capacity of 408,000 acre-feet. This makes a present total of 4,200,000 acre-feet of controlled water, not counting the thousands of private lakes, ponds, and natural lagoons found in the river flood plains.

DE GRAY DAM ON CADDO RIVER

In the Flood Control Act of 1950 the Congress authorized the construction of a multiple-purpose dam on the Caddo River, a west-bank tributary of the Ouachita River, to be known as the De Gray Dam project.

In order to strengthen the benefit-cost ratio of the project and to supply, in part, the demand for future water supplies from cities and towns located in the valley below this dam site, the local interests requested the Corps of Engineers to make use of title III, Public Law 85–500, and plan for the provision of a storage capacity in this project sufficient in size to enable the daily discharge of 250 million gallons of water to be used for domestic, municipal, and industrial purposes. Incidental hydroelectric power will be made from this discharge water whenever possible.

The Corps of Engineers has approved this project, and the Congress voted the initial money for the advance engineering and design work in the fiscal 1960 appropriation bill.

The towns requesting a guaranteed future water supply from this project are Arkadelphia, Gurdon, Prescott, Magnolia, Camden, and El Dorado. In order to firm up this project, the people in the lower Ouachita River Valley have formed, under an appropriate court order, the Ouachita River Water District to deal with the Corps of Engineers in the purchase, distribution, and sale of domestic, municipal, and industrial water made available by the construction of the DeGray Dam.

BENTON DAM ON THE SALINE RIVER

The Saline River, an east-bank tributary of the Ouachita River, also has great need for firming up its low water flow. Accordingly, the people of the Saline watershed have made a study of their water problems, and the Corps of Engineers is now completing a study which will place this proposed project before the Congress for proper authorization.

The need for a future water supply in the Saline River Basin is greater than it is on the main stem of the Ouachita River. For this reason, there is a request for a minimum discharge of 300 million gallons of water per day for domestic, municipal, and industrial use.

Incidental hydroelectric power will also be made from the discharge of this water.

As in the case of the DeGray Dam, a Saline River Water District has been officially formed to deal with the Corps of Engineers whenever water is available for sale from this project.

The towns involved in the future water demand from the Benton Dam project are Benton, Bauxite, Sheridan, Rison, Fordyce, Warren, Hamburg, and Crossett.

MURFREESBORO DAM

The 1950 Flood Control Act authorized a single-purpose flood-control dam on the Muddy Fork of the upper Little Missouri River, a west-bank tributary to the Ouachita River. This project does not have economic justification for flood control only and is under study as a possible water-supply dam for the future.

PUBLISHED MINIMUM FLOW OUTDATED

The minimum low flows accredited to the Ouachita River and some of its principal tributaries in the Corps of Engineers and Geological Survey's publications are outdated and extremely detrimental to present-day efforts to interest large water-using industries. These old records are no longer applicable because better and more realistic methods are now used by the services to determine minimum low flows. Also, in many instances, new water reservoir projects have been constructed and placed in use above the gage stations recording unusually low flows. Under the circumstances and until the old records can be removed or exchanged, present minimum flows cannot be properly accredited.

CANNOT HAPPEN AGAIN

As an example, the published all-time low flow in the Ouachita River at the Camden gage is 125 cubic feet per second. This is given as a 24-hour record which is based on an instantaneous gage reading recorded on September 25, 1943. Incidentally, this was the driest year ever recorded in the Ouachita River Valley by the U.S. Weather Bureau. Also, 1943 was a World War II year, and that

fall the WPB ordered all flow out of the Remmel Dam on the upper Ouachita River stopped for a period of 3 months. This coincidence should be noted and coupled with the fact that the Narrows Dam on the Little Missouri River was not placed into operation until 1949, and the Blakely Mountain Dam did not begin to operate until 1955. These two dams are designed to discharge daily 200 and 1,000 cubic feet per second, respectively, during the low-flow periods of the rivers. It is obvious that the 125 cubic feet per second low-flow recording for the Camden gage can never happen again and should not be left on the books to confuse anyone seeking information about the volume of water available in the Ouachita River at Camden. The year of 1955 was extremely dry, and the lowest flow recorded on the Camden gage was slightly above 600 cubic feet per second. It is quite likely that this will remain the low flow volume for the future.

GROUND WATER AVAILABILITY

The Ouachita River Basin is roughly divided into three topographical areas: (1) the mountain plateaus, (2) the rolling sandy gravely coastal plains, and (3) the delta or overflow river bottoms. Ground water is available in only very limited quantities and for domestic use only in the upland or mountainous portion of the basin. In the coastal plain area ground water is generally available for domestic and limited municipal purposes. In the delta or overflow lands ground water is presently available in very large quantities and is generally ample for such water-using industries as pulpmills and oil refineries.

In the coastal plain and delta areas the water-bearing sands range from a few feet under the surface to approximately 2,000 feet in some places. Generally speaking, the ground water found in the Ouachita River Basin is of good quality, cool, and usable for most purposes with only a minimum of treatment. There is evidence, however, that the ground-water table is gradually being lowered and this makes large water-using industries reluctant to rely upon it for the future.

WATER POLLUTION ABATEMENT AND CONTROL

The heavy concentration of industries along the lower one-half of the Ouachita River has resulted in an unwanted degree of pollution in the river. This pollution has come mainly from four sources: (1) untreated domestic sewage from cities and towns, (2) open-pit mining of ores that result in the formations of acids when flushed into the river by heavy rainfalls, (3) effluents from pulpmills, and (4) oil well wastes, including salt brine extracted from some pumping wells.

These problems have all been recognized by the water pollution control commissions of Arkansas and Louisiana and steps have been taken by these commissions to eliminate or minimize the sources of this pollution. This pollution-abatement work is being done on a time plan and within the next 5 years the present pollution sources will be largely eliminated. This, coupled with the larger low flows resulting from the operation of controlled water reservoirs in the upper watershed, will largely eliminate all of the pollution problems in the Ouachita River Basin.

FUTURE WATER REQUIREMENTS

The Ouachita River Valley Association has been the sponsoring agency for water resources development work in the Ouachita River Basin for the past 66 years and will probably continue its efforts in this direction far into the future.

Four paragraphs from the association's published statement of policy will convey its intentions toward the present and future water supply in the valley:

"Provide for domestic, municipal, and industrial water supplies by reserving portions of all reservoirs now authorized or to be authorized for this specific purpose;

"Develop, in cooperation with other agencies and organizations, a realistic but positive water sanitation program for our lakes, rivers, streams, and bayous;

"Aid in the development of a reservoir and stream management plan that will tend to stabilize streamflows and to eliminate undue low flow periods; and

"Provide the means of paying for all of our water resources improvements through the development of industries that can utilize our water and other natural resources."

The Ouachita River Valley Association concludes that by the year of 2010 the industrial development in this basin will be such that 1 billion gallons

of water per day will be needed to be discharged from controlled water reservoirs to supply the demands, besides the water available for reuse in our natural lakes, rivers, stream, and bayous.

It is the hope of this association that the Senate Select Committee on National Water Resources will incorporate our water program into its report and will aid us in bringing about a fulfillment of our future social and industrial plans.

Mr. WIMBERLY. Referring to agriculture and forestry, we now call Mr. Warren Harang, Jr.

STATEMENT OF WARREN HARANG, JR., PRESIDENT, AMERICAN SUGARCANE LEAGUE

Mr. HARANG. Senator Kerr, Senator Ellender, and Congressman McSween, my name is Warren Harang, Jr. I am a sugarcane grower and president of the American Sugar Cane League of the U.S.A., Inc., a nonprofit corporation of the State of Louisiana, created in 1922 for the purpose of protecting the welfare of Louisiana sugarcane growers and processors.

The membership of the league consists of about 5,000 farmers who produce approximately 95 percent of the sugarcane grown in Louisiana and 40 processor members who process into sugar all the State's cane crop in their 46 cane factories.

Sugarcane is grown in 19 parishes of southern Louisiana. Most of it is produced on the alluvial soils of the Mississippi River Valley, some is grown on the alluvial soils of the Red River Valley, and some in the gulf coastal plain area.

The Louisiana sugarcane area has an annual rainfall of about 60 inches. To the casual observer it would not appear that one of our problems was availability and adequacy of water supply. Unfortunately, nature does not afford us this bountiful water supply property dispersed through the year. Therefore, we need additional research along several lines which I will discuss briefly.

Research is needed to show us how to make the maximum and best use of the rainfall we receive. This should include studies of ways to increase the water holding capacity of soil. Deep tillage experiments now underway should be continued and expanded. The effect which various crops, used in rotation with cane, will have on our soils and their water-holding capacities should be investigated. Vertical mulching on some of our problem soils should be tried. The effect of various chemicals on the texture of soils and their water-holding capacities should be determined. Among the many new chemicals developed each year, one may be found which we can economically use to improve soil texture. There is a place for more research in the matter of handling crop residues to improve soil and water management.

Research is needed to determine the best method or methods to dispose of the excess rainfall. We frequently get such an excess. We do not know whether the system of ditching employed in the Louisiana sugarcane area is best for our conditions. For each of our soil types we need more research to develop facts for use in determining the proper distance between ditches and the proper depth, width, shape, length, and grade of each ditch.

Strange as it seems, we also recommend research on irrigation. Even though the Louisiana sugarcane area has an annual rainfall of

about 60 inches, we have periods of inadequate moisture nearly every year during our cane-growing season. In some years our crops are very adversely affected by lack of water at the time it is most needed. Experiments are needed to determine whether overhead, surface, or subsurface irrigation would be best for our conditions and whether any type of irrigation would be economically feasible. Experiments would be necessary to determine proper timing for irrigation and the amount of water to apply at any given time.

Weather modification research seems worthy of more attention. We are naturally and vitally interested in any properly directed research that might eventually lead to a practical method of obtaining additional rainfall when needed.

In considering research in water conservation and use, it is most important to point out, in addition to our agricultural requirements, the importance of water in the operation of Louisiana's 46 sugarcane mills. Large quantities of fresh water are here essential. An average of 3,000 gallons of water per ton of cane is used. At the peak of Louisiana's 65-day cane harvest, the mills grind 100,000 tons of cane per day and use 300 million gallons of water per day. That is an average of 6,522,000 gallons per day per cane factory. This does not include the water used by Louisiana's seven sugar refineries for which we have no data. We do know their water usage is large. Their operations are not seasonal. They operate during the entire year.

We are fortunate that sufficient water for our cane factories and sugar refineries is available from the Mississippi River and other streams and from fresh water wells. However, in view of the phenominal industrial growth of south Louisiana, which necessitates an ever increasing need of water for industrial use, we can envision the day when we may not be so fortunate as we are today. Therefore, study and research is here indicated.

Also, disposal of the cane factory waste water in a manner which will avoid stream pollution is a problem in some instances. We believe more research on the handling, treatment, and disposal of cane factory waste water would be in order.

It is also germane to the purpose of this hearing to mention flood control appropriations and work by the Federal Government. Such appropriations and work are vitally important to the Louisiana sugar industry. The Atchafalaya Basin Floodway is an essential part of the overall flood control plan for the Mississippi River and its tributaries. The Atchafalaya Basin Floodway accepts diverted water from the Mississippi River and its tributaries and channels this water through swamplands to the Gulf of Mexico. It is only through protection levees that this vast quantity of water is kept from flooding and destroying valuable lands on both sides of the floodway.

A failure of the Atchafalaya Basin Floodway to function properly would be a major catastrophe. Approximately 278,000 acres of sugarcane land could be flooded. The value of this land with improvements exceeds $83 million. Thirty-three sugarcane mills would be subject to the ravages of floods. Four sugar refineries are also located in the possible flood area.

The capital value of property in the Louisiana sugar industry which could be flooded exceeds $258 million. The value of products produced annually by that portion of the Louisiana sugar industry subject to flooding exceeds $60 million.

The foregoing estimates do not take into consideration the very substantial damage which would be suffered by persons engaged in other farm enterprises and by nonfarm industries.

Water transportation is very important to the Louisiana sugar industry. Sugarcane, raw sugar, and refined and other direct consumption sugar move by water. Therefore, we are naturally interested in the maintenance and improvements of present navigable waterways and in the creation of additional navigable waterways.

On behalf of the Louisiana sugarcane farmers and processors, we desire to indicate our appreciation of this opportunity to express to the Congress of the United States, through you, our needs and suggestions in this most worthy undertaking.

Senator ELLENDER. All right.

Mr. WIMBERLY. The next witness, Mr. Chairman, is Mr. Harvey P. Grant, Jr., secretary-manager of the Louisiana Delta Council.

STATEMENT OF HARVEY P. GRANT, JR., SECRETARY-MANAGER, LOUISIANA DELTA COUNCIL

Mr. GRANT. Mr. Chairman, Senator Ellender, Congressman McSween, my name is Harvey P. Grant, Jr.

Delta Council is an economic federation of the people of the northeast Louisiana delta region. We represent the common interests of agriculture, industry, education, forestry, and research. The territory served consists of 11 parishes (counties) comprising an area bounded on the north by the State of Arkansas, situated between the Ouachita and Mississippi Rivers and extending southward to the parishes of Concordia and Catahoula.

Despite the somewhat derogatory remarks of my very good friend Mr. Henri Wolbrette this morning, agriculture is still a big business in Louisiana.

Agriculture is a big business in Louisiana; 1958 cash farm income totaled $391,257,000. Receipts from all crops amounted to $198,885,000 while livestock and livestock products accounted for $162,670,000. The income from cotton and cottonseed combined totaled nearly $54 million.

The income from our area containing 279,000 people is primarily derived from agricultural sources, principally cotton and livestock. There are 12,112 cotton farms in our territory. They initially received 260,092 acres, approximately 45 percent of the State's 1959 cotton acreage allotment.

The average yield of cotton per acre has increased 85 percent in the past 10 years mainly because of the development of new varieties, improved production methods and equipment.

Introduction of new concepts of field layout and water control have permitted more timely and efficient operation of modern production equipment and reduced erosion problems.

Bureau of Agricultural Economics statistics reveal that in 1958 one-row cultivation with mule, hand chopping and hand picking required 155 man-hours per bale of cotton. However, with complete mechanization only 16 man-hours are required. In our area a more realistic estimate for efficient production would approximate 25 hours per bale.

Consider these statistics concerning water usage under today's modern farming conditions. It takes about 500,000 gallons of water to produce a bale of cotton. A pound of beef requires about 3,750 gallons of water for the steer and the grass he eats; a slice of bread including the growing of the grain has used 37 gallons of water. On our farms and in our factories and homes we are now using approximately 1,500 gallons a day for each man, woman and child.

I have mentioned these area and agricultural statistics briefly to illustrate our cotton farmer's financial importance to the economy of Louisiana and to acquaint you with his vital interest in the matters under consideration in today's hearing.

Louisiana agriculture is in a transitional and highly competitive period. We require facts not so much to provide answers needed now as farmers but to raise questions and issues which in the long run concern us all as citizens interested in the economic development of our country.

It is my understanding that primary reliance for compilation of the basic data on water supplies and uses, along with forecasts of future needs, has been placed on Federal agencies in the water resources field and the various States will furnish statements and information regarding their water problems.

Since formal channels have been established for these groups to submit their technical information and recommendations direct to this committee for further evaluation in terms of estimated demands for water, I shall address my remarks chiefly to considerations regarding the necessity for intensified agricultural water research in the production of cotton, particularly in the fields of irrigation and weather studies.

The agricultural conservation program is a National conservation program of the United States Department of Agriculture. It shares with farmers the costs of practices needed for conserving farmland and water.

It is a farmer-Government partnership. Public funds are authorized by Congress as an investment to encourage farmers to also invest in doing now the conservation work that is in the public interest.

The 1958 ACP practices carried out in Louisiana had an estimated monetary value of $8,500,000. A great many of these measures are of incalculable worth, however, in conserving our National water resources.

Extensive consideration of agronomic and climatic factors is required to provide a more accurate means of evaluating the need for supplemental irrigation.

Our fertile soils, approximately 230 frost-free days and an annual precipitation of about 55 inches are favorable for the production of many crops, including cotton.

Precipitation records of the Northeast Louisiana Agricultural Experiment Station, St. Joseph, La., show that the annual rainfall for 1957 was 44.21 inches and in 1958 was 62.53 inches. The area annual normal precipitation is 54.85 inches.

Yet a recent study of 41 years (1914–54) of rainfall and water requirements for cotton in this same area reveals that rainfall was inadequate for optimum cotton production during every one of the 41 years because of poor distribution during the growing seasons.

In connection with suggested research for water usage in cotton production we recommend more emphasis on studies investigating evapotranspiration and its relationship to the waterfall distribution cycle.

Irrigation is a relatively new but recently accelerated practice in cotton production in our northeast Louisiana area. The increased interest following World War II has resulted in a demand for more research and information to be made available to our farmers. This growth in irrigation demands continued emphasis on conservation and efficient use of our natural water resources.

We need much more data on water research if our farmers are to continue to produce cotton competitively in the face of the present and future cost-price squeeze confronting them.

We require more information on soil-water relationships, crop water requirements using irrigation, methods and intervals of application, drainage and erosion hazards.

The efficient use of the available supply of soil moisture is usually a major aspect of good farming. It may dominate crop selection, time and rate of planting, tillage, weed control measures, and fertilization practices. I understand that practically no information is now available on the relative response of different cotton varieties to irrigation and high nitrogen fertilization.

Precision land farming is a growing practice in our mechanized delta area. More of our farmers are finding it practical and profitable. It is being carried out on a basis of drainage as a first requirement with subsequent adaptation of the irrigation system to the drainage system.

There is a great need for investigation into this new procedure in our section. Haphazard planning and installation can be disastrous, both economically and conservationwise. We vitally need more research data on irrigation costs and returns in the delta sections of our State.

Few people are as dependent upon the weather for their economic livelihood as the cotton farmer. He must time every phase of his production schedule according to the weather conditions. The weather largely determines when and where he will plant his crop, when he will cultivate, how and when he will dust or spray for insect control, the time to defoliate, if at all, and how and when the crop will be harvested.

Research in area agriculture-weather relationships has been underway at the Delta Branch Experiment Station, Stoneville, Miss., since October 1, 1958.

Their weather forecasts are helping to eliminate the greatest variable existing today in this section's system of cotton production. The three types of forecasts are for 30-day periods and daily.

Early C. Ewing, Delta & Pine Land Co., Scott, Miss., speaking before the National Cotton Council's Beltwide Cotton Production Conference in Houston almost a year ago, emphasized that the farmer's best chance to take advantage of weather changes is to adapt his practices to forecast conditions. However, he pointed out, progress in this direction is limited by a lack of knowledge of the effects of specific weather conditions on cotton production and how and why these conditions cause changes in the cotton plant.

This pilot weather project for the delta began experiments last fall to determine the effects of relative humidity on cotton. Tests have shown that atmospheric moisture, reflected by relative humidity, affected the moisture of seed cotton much more than moisture applied by the spindles in mechanical picking.

Preliminary results in this field indicated that cotton can be picked earlier in the day with more safety from defoliated fields after a heavy morning dew.

Current experiments include measuring soil temperatures with the progress of cotton plots and determining the relation of sunshine to crop progress.

I cannot overemphasize the urgent need for comprehensive research into water's role in the overall production of cotton. We urgently recommend that this type of research be intensified.

Mrs. Terbush and other speakers have made references to the chaotic conditions governing our national water policy. In this regard I am filing copies of a newspaper column entitled "Twenty-Five Agencies Fight When Single Drop of Water Falls." I think you will find it interesting and it opens with this challenging observation:

> A drop of water falls on the American land. Before it reaches the sea, no fewer than 25 different Federal Government agencies will claim it, examine it, dam it, name it, or fight over it * * *.

And it goes on with some other challenging comments.

Senator ELLENDER. Put the rest of the article in, Senator. It sounded good.

Mr. GRANT. I will, sir. It is quite provoking.

Gentlemen, our Louisiana Delta Council through its officers and board of directors wishes to express its appreciation to the chairman and members of this committee for their courteous reception and consideration given this testimony.

Thank you.

Senator ELLENDER. We are glad to have you, sir.

(The article mentioned above follows:)

[From the Monroe Morning World]

TWENTY-FIVE AGENCIES FIGHT WHEN SINGLE DROP OF WATER FALLS

(By Bascom Timmons)

A drop of water falls on the American land. Before it reaches the sea, no fewer than 25 different Federal Government agencies will claim it, examine it, dam it, name it, or fight over it.

Probably no other material attracts the constant attention of so many segments of the Federal bureaucracy as the Nation's No. 1 resource. Normally, the sprawling system works well enough, but sometimes agency rivalry breaks into open paper warfare.

While it is still in the air, that drop of water is almost exclusively in the domain of the Weather Bureau, a branch of the Commerce Department.

But once it's on the ground, the trouble starts. If it falls on public land, it is literally owned by the Bureau of Land Management of the Interior Department—that is, unless the public land is part of a national forest, which is administered by the Agriculture Department, or a national park, which is under the control of the National Park Service, another Interior Department agency.

The Bureau of Land Management, which owns as much as 70 percent of some States, often builds small dams to cut down runoff. The Forest Service does the same thing—mainly to help trees grow. The Park Service, on the other hand, wants no reservoirs encroaching on its natural areas.

If the water turns to snow, it is measured by the Forest Service, whose findings are published by the Soil Conservation Service. The SCS is another agency of the Agriculture Department.

But if the water seeps into the ground, it is measured by the Water Resources Branch of the Geological Survey, which is part of the Interior Department.

If the groundwater becomes brackish, still another Interior Department unit enters the picture. The Office of Saline Water will try to remove the minerals.

Water streaming across farmland is of great concern to the Agriculture Department, which has its own set of agencies to deal with the erosion problem.

One program provides for small dams to hold water on farms to halt downstream flooding. This is the small watershed project, administered by the Soil Conservation Service.

Meanwhile, the agricultural conservation program also is paying farmers to build small dams. Every now and then someone proposes to merge the ACP with the SCS, but most farm bloc Congressmen are violently opposed.

At the same time, the soil bank conservation reserve is urging farmers to build small dams and paying them bonuses if they do. The soil bank is administered by the Commodity Stabilization Service, which is a separate and distinct branch of the Agriculture Department.

In 10 Plains States the Great Plains program is also making money available for conservation practices—including small dams.

In practice, this is less confusing than it appears. The farmer merely goes to his county agent and gets whatever help he can.

When there is enough water in a river, several agencies will try to dam it up. The Bureau of Reclamation, another branch of the Interior Department, does much of the dam building in the 17 Western States, especially if irrigation or electric power is involved.

But the Army Engineers, part of the Department of Defense, also build big dams. Theoretically, the Engineers are concerned only with inland navigation, but this job has long since involved them in flood control—which means upstream dams. Upstream dams are often good hydroelectric sources—and the overlapping continues.

But neither the Reclamation Bureau or the Engineers build a dam without approval by the Fish and Wildlife Service, which is also in the Interior Department. The FWS makes sure that salmon and other fish get home to spawn.

The FWS also runs the widespread system of wildlife refuges, most of which are at least swampy. It also keeps its eye on swamps in general. There are thousands of prairie potholes in northern Minnesota and North Dakota that the Soil Conservation Service has been trying to drain over the bitter protests of fish and wildlife officials who claim drainage would destroy nesting grounds for ducks and geese.

The Federal Power Commission, an independent agency, has its say-so whenever a dam produces electricity.

If there is a dispute over whether to call a little stream Whiskey Creek or Sweetwater Gulch, there's a Federal agency to decide the question. It is the Board of Geographic Names, in the Interior Department. The BGN has pretty well covered the U.S. map and is now naming all the places in foreign countries.

If the water becomes polluted, the Public Health Service will analyze it, and strongly urge somebody to purify it. The Community Facilities Administration, part of the independent Housing and Home Finance Agency, will supply matching funds for the purification plant.

So far, we haven't mentioned the Treasury Department, but it has not been left out. Besides taxing all those dambuilders, farmers and fishermen, it runs the Coast Guard, which polices the waterways.

No list of water agencies would be complete without mention of the Federal Flood Indemnity Administration: or the International Boundary and Water Commission of the United States and Mexico; or the International Pacific Halibut Commission, or the International Pacific Salmon Fisheries Commission.

Senator ELLENDER. Next.

Mr. WIMBERLY. From the American Rice Growers Association, Mr. Harry Chalkley.

STATEMENT OF HARRY CHALKLEY, VICE PRESIDENT, AMERICAN RICE GROWERS ASSOCIATION

Mr. CHALKLEY. My name is H. G. Chalkley. I am a ricegrower and irrigator and vice president of the Rice Growers Association representing the State of Louisiana.

I want to have the privilege of filing a brief within the time set set out by Senator Ellender in connection with some factual matters. But I do want to say to you, first that we are the only users of water in Louisiana who use basically the water that falls on the State. Our rice area extends from approximately Lafayette, La., to the Sabine River and from an area about 40 miles north of Lake Charles to the Gulf of Mexico.

Rice requires 41 inches of water for maturity of which we receive approximately 19 inches in normal rainfall. The difference, or 109/10 acre-feet of water, must be supplied from the reservoirs. Basically this is supplied both from surface water and from subterranean water.

In connection with the surface water we have spent millions, in fact billions of dollars draining southwest Louisiana and now we are in a position——

The CHAIRMAN. Wait a minute. Say that again.

Mr. CHALKLEY. I said we spent millions and the Government has assisted us to where it is nearly a billion dollars in draining southwest Louisiana and now we are in a position to request our own and Government assistance in stopping the flow of this water to the sea.

The Calcasieu River, which is the center of this rice area, drains an area in its length about 200 miles and has a very great supply of water. It is a very deep stream. About 40 years ago the water at Lake Charles at low water stood at 1.5 above Menlo Gulf. Today the water at Lake Charles stands at zero. At a point 40 miles above Lake Charles on the river the gages showed plus 5 on Menlo Gulf. Today the tide rises and falls there twice a day. So that the water, where we get 58 inches of rain annually as an average, is more than sufficient to supply all of our needs. We run out of water regularly, and as you heard this morning the industries are now worrying about brackish water, lack of fresh water for the development of the industries in southwest Louisiana.

This has been brought about basically by the opening of the streams so that the runoff water would go to the sea much more rapidly than it used to, also the denuding of the forest has speeded up the flow of that runoff water to the streams.

The town of Kennard, that lies 60 miles above Lake Charles by river, used to take a crest of water in the Calcasieu River 7 days to reach from Kennard to Lakes Charles. Today it makes it in less than 48 hours.

So you can see that the tremendous runoff that we are experiencing is causing the shortage of water.

I would like to supplement the statement regarding the ground water. The ground water in the Lake Charles area, as you were told

this morning, has dropped to 100 feet below the surface where not too many years ago it flowed naturally during the winter months. This has been greatly accentuated in the areas where they are taking tremendous quantities of water for industrial uses.

Mr. Smith from Cities Service stated that their water level went down to 100 feet below the surface. If you go away from Lake Charles a distance of about 30 miles in a circle, that is, a radius, you will find that the water is only down some 25 feet, showing the pull in is to the Lake Charles area and that by virtue of the stream being lower (the Calcasieu River), the outcroppings are not being kept wet so that the water can flow back into the subterranean sands and recharge them as it is used.

Those outcroppings are basically out of order today.

I wanted to make that statement because I wanted to clarify the idea that the water table all over had dropped 100 feet. It has dropped 100 feet and it is still dropping.

Now, the public works in Louisiana has made a study of the subterranean sands and we find that in the Lake Charles area there are three basic sands but they are in the form of a fork which takes off from a main body which lies to the east around Crowley to Lafayette. If we pull that water down much lower we are going to pull the salt water into the bottom of those sands and while Lafayette and Crowley may not get salt water as fast as we do, we are going to have it in the Lake Charles area very rapidly.

The CHAIRMAN. Where is Crowley from Lafayette?

Mr. CHALKLEY. Crowley is about 20 miles west of Lafayette.

The CHAIRMAN. How much area in southwest Louisiana is devoted to rice production?

Mr. CHALKLEY. There are 450,000 acres of rice under the present control program planted to rice. Prior to that time for many years we had planted approximately 600,000 acres.

The CHAIRMAN. Do you know how much is used for rice production in Arkansas?

Mr. CHALKLEY. Arkansas is producing rice on about 420,000 acres.

The CHAIRMAN. The two of them constitute the total in the Nation, approximately?

Mr. CHALKLEY. No, sir. Texas raises as much as Louisiana and California nearly as much. Mississippi raises a small amount of rice compared to the rest of us.

Senator ELLENDER. The total, as I remember, is 1,635,000 acres throughout the country.

Mr. CHALKLEY. We have 350,000, Arkansas 425,000, Texas 447,000.

The CHAIRMAN. Approximately what is the value of production per acre per year?

Mr. CHALKLEY. In Louisiana the value of production per acre per year is approximately, for the whole State, is approximately $55 million or about $120 per acre.

The CHAIRMAN. Thank you.

Mr. CHALKLEY. I want to bring out one other thing in connection with this.

During the period when this drainage was taking place, it was found necessary to put salt water locks on the Mermentau River which lies just east of the Calcasieu, in the intracoastal canal just east

of the Calcasieu River and in the Vermilion River at what we call Sooner Bayou by which we put into a reservoir approximately 165,000 acres of marsh land which we brought back to its original amount of water which was about 2 feet above the Menlo Gulf which had been drained out completely by the intracoastal canal. That has acted as a cushion to the rice area lying between those areas, but for the rice area taking water from the Calcasieu and the ones lying to the west and to the east of that reservoir we still have the problem of salt water intrusion.

Our feeling is that if we would return particularly the Calcasieu River to its original normal low water by the installation of low water dams so that it would not affect the drainage of the normal areas but would retain in that area an ample supply of fresh water it would not only provide surface water for industry but it would also recharge the subterranean sands as they were being recharged before this drainage project started.

Now, one other thing in this connection, we in Louisiana—Senator Ellender was raised here and he learned how to swat them—have mosquitoes. When the marsh lying between the Calcasieu and Vermilion River was dry or partly filled with salt water we had these terrific mosquito plagues because the natural enemy of the mosquito is the fresh water, and they were the spawning grounds of all our trout, bass, and so forth in Louisiana and they went from there upstream as they grew up. Since we got even this area again covered with fresh water up until we had Hurricane Audrey, which put salt water in it again, our mosquito troubles had been drastically reduced. We feel that as the fish is the natural biological clarification of the stream, he is also a natural enemy of the insects, that we will not only improve our agriculture by supplying an adequate supply of water for it, for our industry, but we will certainly increase the possibility of a little more peace and quiet from these mosquitoes.

This is true because in Spain they actually put fish in their rice fields to eat up the larva or the mosquito eggs as they form around the rice plants and the fish are actually in the field and in the rice fields. There are no mosquitoes in the area, they cannot control it even with fresh water, they have the mosquito seizures which we have here.

If there are no questions, Senator.

Senator ELLENDER. Thank you very much, Mr. Chalkley. I thought this lowering of the water level was all over the area but you say that it extends about——

Mr. CHALKLEY. I have here—I will give you this.

Senator ELLENDER. You put that in the record. I think it is very important to put that in the record.

Mr. CHALKLEY. Because this shows what the U.S. Coast and Geodetic Survey has found out about it.

The CHAIRMAN. You are talking about the underground aquifer?

Mr. CHALKLEY. Yes, sir. If you would like to have this in the record, I have this copy. It is printed.

Senator ELLENDER. I think it ought to be filed with the record. It is important.

(Water Resources Pamphlet No. 6, published by the Louisiana Department of Public Works, has been retained in the committee files.)

Mr. CHALKLEY. Because it shows the different charts, this showing how the water level is pulled down in that area as contra to the other areas.

Senator ELLENDER. Thank you, Mr. Chalkley.

(The additional statement of Mr. Chalkley follows:)

ADDITIONAL STATEMENT OF H. G. CHALKLEY

My name is H. G. Chalkley. I am a rice producer and a canal operator taking irrigation water from the Calcasieu River watershed, Lacassine Bayou and the Sweet Lake marsh area which receives its water from the Mormentau Basin and adjoining streams lying between the Calcasieu River Lock on the Intercoastal and the Schooner Bayou Lock in Vermillion Parish. I am here, representing the American Rice Growers Cooperative Association of Lake Charles, of which I am vice president, representing our producers in Louisiana, as well as my own interests.

I wish to supplement my testimony, given at Alexandria, La., on December 1, 1959, with the following information:

(1) The normal rainfall in the rice growing area of Louisiana averages slightly in excess of 57 inches annually. This rainfall is fairly evenly divided over the 12-month period with slightly higher rates in the winter and early spring and late fall, and lower rates in June, July, August, and September, the normal growing period of rice.

Rice, while planted as other cereals, requires constant irrigation during the growing season and the amount of water required for normal growth varies from 39 to 42 inches, of which from 22 to 28 inches must be supplied from surface or ground water. This variation is brought about, normally, due to rainfall. However, there is a surplus of water during the year from normal rainfall of from 15 to 18 inches, and when the total area of the drainage basin in the rice growing parishes is compared with the yearly acreage of rice, the tremendous wastage of water flowing unrestricted to the gulf clearly shows that this area has tremendous water resources if they were only impounded and controlled.

The Calcasieu River originally was one of the main sources of recharging the subterranean sands, as outcroppings occur over the entire basin, starting about 15 miles (air) north of Lake Charles along a line running east and west from near the west boundary of Louisiana to Vermillion Bayou in Lafayette Parish and extending northward 40 to 50 miles.

Originally the deep wells in the Lake Charles area had an artesian flow most of the year, only dropping to ground level during the midsummer when irrigation demands were heaviest, but being recharged each winter.

The increase in drainage and the deepening of the lower Calcasieu River and bar from 6 to 36 feet has dropped the water level, at low water, at the docks at Lake Charles, from 1.5 feet above mean low gulf to zero, and now the tide rises and falls every 6 hours as far as 50 miles north of Lake Charles by river, at which point, the old low water level was 4.5 feet above mean low gulf before the channel was opened. The speedup in drainage has also been a cause of tremendous loss of water reserves. Twenty years ago it took 6 to 8 days for water cresting at Kinder (70 miles by river) above Lake Charles to reach Lake Charles. Now this crest arrives in less than 48 hours and while low water at Kinder originally stood at 7.5 feet above mean low gulf, the figure is now 2.5 feet. This exposes the outcroppings and reduces materially the time they are wet and recharging.

(2) A low-level dam or salt-water barrier should be installed just above Lake Charles immediately to not only prevent contamination of the river and possible salting of the subterranean sands, but to recharge the subterranean sands, and it should be set at the old low water mark of 3 feet above mean low gulf at the confluence of the West Fork with the main river about 10 miles, by river, above Lake Charles.

(3) This dam is needed immediately, as the water level on the subterranean sands is dropping about 5 feet per year, and in the area of industrial development lying west of Lake Charles proper it now is below 100 feet and the chlorine content is rising.

(4) The water development should be carried out immediately to not only assure ample surface water for not only industry, agriculture, and wildlife, but should be done before the subterranean sands are further contaminated or polluted.

(5) The development of the petroleum and chemical industries is absolutely dependent on adequate and abundant supplies of fresh water as well as an abundance of raw materials. The drinking water for this area also comes from the same subterranean sands and the health of some 150,000 people is being endangered by this lack of water control.

Your attention is directed to the Water Resources Pamphlet No. 6, published by the Louisiana Department of Public Works, a copy of which was filed at the hearing, as well as reports on surface and ground water made by U.S. Coast and Geodetic Survey.

Mr. WIMBERLY. Mr. Chairman, the Louisiana Forestry Association, Mr. C. H. Lewis, Jr.

STATEMENT OF CHARLES H. LEWIS, JR., EXECUTIVE DIRECTOR, LOUISIANA FORESTRY ASSOCIATION

Mr. LEWIS. Senator Ellender and Senator Kerr, my name is Charles H. Lewis. I am executive director of the Louisiana Forestry Association and here today representing the 2,560 members whose prime interest is in the Forestry resources and forest industry of the State. We also served as the coordinating agency in compiling testimony from the Southern Pine Association and from the Texas Forestry Association, which we would like to have made a part of the record, and they are being submitted to you now.

We are aware of the water problem facing this Nation and are in complete accord with the aims and objectives of this committee. We agree, too, that this is a matter for the Federal Government to coordinate; for no area can alter its water supply without affecting to some extent the water resources of others.

In this testimony we do not propose to delve into water control as it relates to the flood-control aspects of the major streams, the Mississippi and the Atchafalaya, but rather as it concerns surface storage and runoff control on secondary streams in Louisiana.

First, we submit that there is no real water shortage in Louisiana. Unlike most of the United States, Louisiana is blessed with an abundance of water. Fully two-thirds of the land area of our Nation is drained through and on both the east and west boundaries of our State. We have 4 million surface acres of fresh-water streams, lakes, and waterways—a total of 1½ acres of surface water for each resident of our State. In addition we have hundreds of miles of Gulf of Mexico shoreline, plus innumerable salt-water basins. Our average annual rainfall is 56 inches, compared to the national average of 30 inches, more than enough water to satisfy all the divergent needs of the interests represented here today if a fraction could be trapped and stored efficiently. How to do this—to trap it and store it efficiently—while minimizing the drain on other vital needs of our economy is the big problem in Louisiana, as we see it.

In the past, rainfall conservation and runoff control, to many, has been synonymous with terraces, dams, levees, and lakes. This is as it should have been because, in the 1940's, this was the most pressing need for immediate and needed control of runoff and floods in these watersheds.

From the Civil War days of 1860 through the depression days of the 1930's the hill lands of Louisiana were farmed intensively for row crops, the most notable of which was cotton. The forests were de-

pleted and the soil was stripped of its cover. Heavy Louisiana rainfall took its toll of precious topsoil. And, as we all know, muddy streams, flash floods, and poverty were the progeny of this pattern of land use.

Since that time, however, multiple pressures of economics, such as increased cost of farm labor and fertilizer plus the inherently low productivity of hill farmland, forced the hill farmer to convert his land to other and more profitable uses. This generally has meant conversion to improved pasturelands and tree farms and both crops, grass, and trees, are the best of soil stabilizers. Together, farmers and forest industrialists of Louisiana have planted and managed their timber so well since that time that the State once again has become a great timber producer. Louisiana is ranked first in value of pulp and paper products manufactured and employs more workers in so doing than any other southern State.

Dramatic examples of the land-use revolution can be seen all across the State. In Jackson Parish, for example, land-use records show that 90 percent of the land farmed for cotton and corn in 1940 has been converted to trees and pasture. In Webster Parish—25,000 acres of land produced cotton in 1940—2,400 acres produce cotton today.

What have been the results of such drastic change in land use? On the surface of the ground, the results are evident. Hay fields that once were water-logged are again producing hay. Flash floods which once accelerated erosion of the hill country and bled the soil are seldom seen any more. Road inundation, a commonplace thing in the past, has for the most part disappeared. In the 1940's parts of highways were submerged for prolonged periods when the rainfall exceeded 3 inches during a 12-hour period. Today, a thunderstorm accompanied by 3 inches of rainfall poses a threat in very few areas.

And what does the subsurface water supply look like? A "tale of two areas" in Louisiana might serve to illustrate a point:

Minden, a north Louisiana city, expects to double its population by 1980. The city obtains its water from wells located in a pastured and forested watershed. A survey by independent water engineers had this to say about that city's water supply:

> **These wells (five in all) provide an adequate quantity of good quality water to meet present needs and the needs several years in the future. However, the wells are located quite close together, all falling within the circumference of a circle having a radius of 200 feet. As the demand for water increases, the degree of interference between the drawdown cones of these wells will increase sharply. This will reduce the yield from each individual well and will make it necessary to space additional wells at sufficient distance from the existing well field to eliminate interference.**

It is significant that the recommendations for increasing the city's water supply did not mention surface water impoundment. Had it not been for the change in land use in the watershed serving Minden, the simple expedient of tapping the underground reservoir would not have been possible.

Now take a case in southwest Louisiana, where subsurface water is used for agriculture, industry, and urban and country water supplies. Wells—tremendous wells—tap the sand and gravel beds of the Chicot Reservoir and there has been some concern about a water shortage.

But this is what the Louisiana Department of Conservation in its study of the ground water of southwest Louisiana has to say:

As a general statement on aquifer thickness, it can be said that some of the sand and gravel beds of the Chicot Reservoir of southwest Louisiana are among the thickest uniformly permeable granular water-bearing beds in the United States * * * the acquifers of the reservoir are continuous for more than 100 miles from west to east and equally as far from north to south. No aquifer of the reservoir suitable for development of supply wells will fail to provide moderate to large perennial supplies, because of the aquifer's great areal continuity and effective hydraulic interconnection with other aquifers of the reservoir.

It is in this area that the greatest reforestation effort in our State has been in progress for 15 years.

We believe that our water problems are already being solved by natural phenomena resulting from our changing land-use pattern. Consequently, in our opinion, the construction of dams, lakes, and levees which were considered an immediate answer to the flood and water conservation problem of many sections of Louisiana in the 1930's and 1940's can no longer be considered essential for this purpose.

Indeed there is reason to view some projects now on the drawing board with alarm. Every day we learn of plans to dam up streams of small watersheds over the length and breadth of the State, the purposes of such impoundments being to prevent floods, conserve water for industrial use or—and this is more often the case—to provide added recreation facilities. In our zeal to control water, are we losing sight of another most important national resource need—wood for our exploding population in 2000 A.D. (only 40 years hence)? If water projects are initiated at the present rate in Louisiana—if we continue to dam the uplands and drain the lowlands as we are wont to do, we may change completely the physical and ecological characteristics of these lands. A continuation of this practice will effectively limit the capacity of our State for producing a valuable and much needed resource—wood.

Each new impoundment means a loss of additional acres of forest lands from productivity and therein lies a problem, we believe, that dwarfs all others in severity. Since 1945, an average of 10,000 acres of forest land per year in Louisiana have been flooded as a result of major water impoundment projects. This is a total of 150,000 acres of forest land dedicated to flood prevention, water conservation, and recreation forever—and this is a long time.

How much is this worth to our State for flood control and water conservation for agricultural and industrial use? We can only speculate upon the flood control values, but we do know that the industrial and agricultural values are quite low, almost nonexistent in Louisiana. On the other hand, we can quite accurately compute the value to the citizens of Louisiana in wood loss from 150,000 acres of high quality timberland.

First, we know that land now under water as a result of water impoundments would produce 1 cord of wood per acre per year with proper management. Second, we know that the sale of paper manufactured from 1 cord of wood returns $85 to the community. Multiply this by 150,000 acres in major impoundments and the total monetary

loss is $12,750,000 per year. And to this amount add $850,000 a year for the additional 10,000 acres destined to go under water as a result of planned impoundment programs. Only 10 years from now, this loss will reach the staggering sum of $21,250,000 a year.

But we have only spoken of monetary loss. What of our need for wood in the future?

As of 1957 there were 489 million acres of commercial forest land in the United States and coastal Alaska. At that time there were 2.85 acres of forest land per person on which to produce the wood and wood fiber for the Nation's needs. By the year 2000, however, our population is expected to increase to 275 million people. This means there will be only 1.75 acres of forest land per person—and this will be true only if there is no decrease in the 489 million acres of commercial forest land.

Adding to the problem, too, will be the increased demand for wood products from this swollen population. The Stanford University survey of this Nation's anticipated need for wood over the next 40 years indicates that the need for pulp and paper alone will be 250 percent greater in the year 2000 than in 1960.

As you know, some forest lands are more productive than others and the South's forests are the most productive of all. The pine-producing section of the South and of this State has long been known for its ability to produce pulpwood, poles, sawlogs, and other forest products of excellent quality and quantity. Because of its ability to produce wood, the South is expected to furnish 75 percent of this anticipated demand—indeed the South already is producing 60 percent of the Nation's supply of pulpwood.

Of course, pressures upon these vital timber lands for uses other than water projects will continue to be exerted—again because of the increase in population. Growth of cities alone will convert thousands of acres of forest lands to subdivisions, bringing great riches to the owner to be sure but nevertheless denying commercial production of timber on this acreage. With 405,000 acres of land in Louisiana, now occupied by State-operated roadways alone, we can expect much more acreage to be needed for future highways that require 14.3 acres per mile. Add to these the uses of the demands for pipeline and powerline rights-of-way plus others too numerous to mention and the expectation of wood production from the remaining acres appears optimistic, to say the least, even from the South.

In summation, then, we ask you to consider the following in your deliberations:

1. The problem of flood control and water conservation in the small watersheds of Louisiana already may be solved through change in land use—from row crops to tree farms and pastures.

2. We don't believe the State of Louisiana and its citizens can afford the loss of 10,000 acres of productive timber land each year, with the corresponding annual financial loss of $12¾ million accelerated at the rate of $850,000 per year.

3. This Nation's need for wood 40 years hence, should receive serious consideration by our long-range planners when surface water impoundment projects are contemplated in the forest regions of the South.

4. Caution should be observed before approving future water impoundment projects, lest irreplaceable wood-producing lands be lost needlessly.

5. Any underestimation of surface water storage needs for the future can be corrected within a matter of a few years. Inundation of timber lands is a final act. Water shortages can be alleviated in several ways, as we are learning. For example: the treatment and reuse of waste water and conversion of sea water to fresh water through the use of atomic energy; but no one has yet learned to grow a tree under water.

Sir, I thank you for your indulgence.

(The statements referred to above follow:)

STATEMENT BY THE SOUTHERN PINE INDUSTRY COMMITTEE

The southern pine industry, according to the latest publication of the U.S. census report, consists of 24,068 large and small sawmill operations situated in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. This industry employs more than 350,000 persons full time and many thousands more part time.

The Southern Pine Industry Committee, which represents the entire southern pine lumber manufacturing industry, has a long record of cooperation with Government and private agencies on all matters pertaining to forests and forest products. The industry committee recognizes the importance of water resource development, and appreciates congressional concern evidenced by creation of this Senate Select Committee on National Water Resources. We commend the committee's decision to conduct field hearings and to get local opinion regarding future water need. It appears, though, that insufficient time is allocated to the forest industry to adequately present its concern over a matter that has such a profound effect on forest land ownership.

Industrial expansion will undoubtedly require additional water. This increased demand may be partially satisfied by reuse of water as practiced by some industries. Another encouraging sign is the anticipated use of nuclear energy for power, which could reduce the need for power elements in reservoirs, and reduce their size and cost. According to analyses by competent engineers, the power element included in some reservoirs causes a waste of water during periods of high riverflow, and a shortage of water during periods of low riverflow.

Reuse and more efficient water utilization cannot be expected to preclude the construction of reservoirs, but they can result in a reduction in necessary capacity of reservoirs. Decreasing reservoir capacity without a sacrifice of the volume of usable water would effect substantial savings by (1) reducing the amount of farm, forest, and other land to be inundated; (2) making many costly facility relocations unnecessary; (3) reducing the dam size; and (4) causing less disruption of industry. The resulting savings of tax money in this period of high cost of government should be given high priority.

Future water resource development projects must, of necessity, be carefully studied and efficiently planned to insure that they are clearly in the public interest. Full consideration must be given to present land use and its effect on existing industry. In the case of forest land, which is so often acquired for reservoir sites, the benefit to the economy from present land use should be clearly recognized and fully considered in computing costs and benefits. The existing contribution to the economy should be deducted from the anticipated contribution resulting from project construction, so that an accurate analysis may be made of the projects' merits.

The industry committee recognizes that the forests constitute our greatest renewable resource. Under expending forest management practices, resulting in sustained yield programs, the forest industries are increasing their already large contribution to the economy of the South as well as to the Nation. This increase in forest cover is providing more and better water by causing a larger percent of rainfall to enter the soil, thus retarding runoff and erosion. Research by foresters and hydraulic engineers in the Tennessee Valley revealed that forest

cover on bare land reduced peak flows by as much as 92 percent, prolonged runoff up to 500 percent, and reduced sediment so that soil loss became negligible.

Forest products manufacturing industries have been constructed and enlarged because good forest management practices are increasing the yield of forest product. Without an adequate source of timber, these industries cannot exist, much less expand to provide sufficient forest products for an ever-expanding population. Future demand for forest products has been projected, by the Forest Service of the U.S. Department of Agriculture, to such levels as to cause serious concern among members of the Senate Agriculture and Forestry Committee, the House Agriculture Committee, and the Senate and House Appropriations Committees. Congress has appropriated vast sums to assist States and private landowners in planting and protecting the forests. The soil bank program, partially conceived to provide future supply of forest products, has expended millions of dollars for tree planting on farmland taken out of production to reduce farm crop surplus. Despite the favorable growth-drain ratio in southern pine (according to the U.S. Forest Service "Timber Resources for America's Future") there is no surplus of forest products today, and even if a surplus were to develop, there would be no storage problem as is found in storing surplus farm crops.

Well-managed forest lands have been subjected to increasing demands to provide rights-of-way for highways, electric and gas transmission lines, as well as sites for urban development and water resource development projects. These losses have had a retarding effect on some forest management programs, and on certain industries dependent on the forest for raw material. As an example, one recent water resource development project in the South required several thousand acres of forest land which had been under sustained yield management for many years by a progressive lumber company. The loss of forest products from this forest made it necessary for this lumber company to purchase national forest timber in a competitive market to maintain its desired production.

Well-managed forests represent many years of intensive effort by farsighted individuals and companies who displayed faith in the future market for forest products and their right to own and retain forest land. The development of well-managed forests is not a simple matter, and requires considerable expenditure for protection from forest fires, most of which are man caused; insect and disease attacks; and, in many cases, unrealistic taxation.

Water resource policies, in our judgment, should be developed to insure that full recognition is accorded the landowner whose lifework is threatened by the loss of his holdings. Every effort should be made to make certain that damage to the landowner is held to the irreducible minimum. The 86th Congress recognized inequity in land condemnation cases for military construction by enacting Public Law 86-317. This law permits farmers and others to apply for moving costs resulting from their loss of land taken for military public works projects. Well-managed forest lands are unique in that they are not generally available for purchase. Even if the injured party is able to purchase bare land, it would require up to 70 years to develop it into a comparable degree of production.

One way to insure equity when forest land is taken for public need is to provide for compensation in kind rather than requiring payment in cash. The Government, representing the public who will benefit from the project, should, at the option of the private owner, provide for the replacement in kind through the exchange of similar and suitable publicly owned forest lands of equivalent productive capacity. In many areas of the South the national forests, most of which were purchased at distress prices during the depression of the 1930's, are intermingled with privately owned lands, and they could be used to compensate affected private landowners. A Government policy of compensation in kind would encourage the practice of good forest management, prevent disruption of existing forest-management programs, and maintain the supply of forest products for dependent industries.

Land exchange is neither new nor a drastic departure from tradition, because it has been efficiently utilized by many forest landowners. Private forest landowners commonly make exchanges to consolidate holdings and to provide more efficient protection and to facilitate forest management. Governmental agencies and private owners have for years made exchanges for mutual benefit. The Departments of Agriculture, Interior, and Defense have made many forest land exchanges. For example, the Department of Agriculture, through the Forest Service, acquired hundreds of thousands of acres of cutover timberland by

exchanging national forest timber for cutover timberland. This acquired land was then incorporated into the national forests.

The Department of Interior recently reported a transfer of 52,000 acres of public land in the McCracken Mesa area of Utah to the Navajo Indians to complete a land exchange agreement under which the Navajo Indians received additional acreage in compensation for lands they surrendered to permit construction of Glen Canyon Dam, a key feature of the billion-dollar upper Colorado River storage project.

The Southern Pine Industry Committee respectfully requests that this committee, in its study of water resource policies, give careful consideration to the injustice to private forest landowners in the taking of their irreplaceable timberland assets for public benefit without providing compensation in kind even though the public, through the Federal Government, owns more than 25 percent of the land area of the United States, including many millions of acres of forest land.

If private forest management is to continue to expand, particularly in areas that may be required for future water resource development, a method of providing equitable compensation must be adopted.

STATEMENT OF E. R. WAGONER, EXECUTIVE SECRETARY, TEXAS FORESTRY ASSOCIATION, LUFKIN, TEX.

Some 12 million acres of commercial forest land are located on the watersheds of several east Texas rivers. Included in this region are the entire recharge areas of the important water-bearing strata from which industrial and municipal water is pumped for all the population centers of east Texas. The people and industries of these vital industrial areas are alike dependent for their future water supplies on sources that may be vitally affected by conditions on these forested watersheds.

Intelligent management of these timberlands in the interests of these crucial watershed resources must be founded on a sound knowledge of the relationships of these lands to the surface and subsurface water supplies, and of the intricate hydrologic and biological interrelations between water and the conditions of watershed lands.

With minor exceptions, these necessary facts are unknown at the present time. The very limited watershed research that has been done in the Gulf Coastal Plain has been located on geologic materials that are only remotely related to the soils and geology of east Texas, or of comparable lands in the Central Coastal Plain throughout the South.

Research is urgently needed on the less erosive soils, both rolling and flatlands, which make up the bulk of the Gulf Coastal Plain watersheds and supply the important water-bearing strata beneath the ground. Such studies should determine the hydrologic characteristics of the important soils of these areas, the extent to which they can be modified by changes in cover conditions, and the effect of such changes on surface runoff, erosion, low water streamflow, and recharge of ground water supplies.

Because Texas conditions are very similar to those in other parts of the Coastal Plain where similar research is needed, much that could be learned by research in Texas would be applicable to similar forested lands in other coastal States. Similarly, some of the information needed in Texas could be derived by studies on properly chosen soils in other States, but important phases, particularly those relating to underground water supplies, would require local study.

Due to the above conditions, the following resolution was passed by the Texas Forestry Association at its 45th annual meeting in Conroe, Tex., October 9, 1959, and is respectfully submitted for consideration:

"Whereas there is little or no information available regarding the specific influence of forests on streamflow and erosion control in the middle and upper parts of the Coastal Plain of Texas: Therefore, be it

"Resolved by the Texas Forestry Association in annual meeting assembled at Conroe, Tex., on October 9, 1959, That there be research on this subject initiated by a qualified public agency; namely, the Texas Agricultural Experiment Station, the East Texas Research Center of the Southern Forest Experiment Station of the U.S. Forest Service, or the Agricultural Research Service of the Department of Agriculture."

The Texas Forestry Association urges that water development plans include provision for prompt initiation of such research by an agency experienced in watershed studies on forest land so that adequate information will become available at the earliest possible date.

The CHAIRMAN. I appreciate the statement.

Senator ELLENDER. Thank you very much, Mr. Lewis. It was very interesting.

Mr. WIMBERLY. Mr. Chairman, our next witness is Mr. L. R. Matthias, executive vice president of the Red River Valley Association.

STATEMENT OF L. R. MATTHIAS, EXECUTIVE VICE PRESIDENT, RED RIVER VALLEY ASSOCIATION

Mr. MATTHIAS. Senator Kerr, Senator Ellender, and Congressman McSween, I have a very brief statement to make. It is an informed suggestion to this committee on two problems that we consider most important in the Red River Basin.

Since the 1958 water supply section was adopted by the Congress we have several reservoirs that are in the process of being built. To be specific, the Cooper Reservoir. In this reservoir we have a maximum storage of 115,000 acre-feet. The cost per acre-foot to the local interest is running about $70 per acre-foot. It exceeds the financial ability of three small towns who intend to purchase the water storage.

The CHAIRMAN. You mean intend to purchase water for their municipal and domestic use from the storage facility?

Mr. MATTHIAS. That is right, sir. Yes, sir, they are thinking in terms and I am using this purely as an example, they are thinking in terms of possibly 25,000 acre-feet, which fits within their financial ability and also their immediate needs as they see it. Now the question is whether we are going to preempt a reservoir site by putting a lesser amount than the maximum that should be placed in there.

The CHAIRMAN. You do not think we should, do you?

Mr. MATTHIAS. I do not.

The CHAIRMAN. I do not either.

Mr. MATTHIAS. I think the full capability of that reservoir site should be used. Now in the years to come we are going to——

The CHAIRMAN. The demand will be there.

Mr. MATTHIAS. It will be there but it is not evident at this time.

The CHAIRMAN. And the people that are now there are not able to make the commitment asked for, as contemplation is given to the building of the full-size reservoir.

Mr. MATTHIAS. That is right, sir.

The CHAIRMAN. What is your suggestion?

Mr. MATTHIAS. My suggestion is that we attempt to formulate a program whereby we can stockpile storage in these reservoirs as they are constructed.

The CHAIRMAN. Are you going to sponsor an amendment to the 1958 title 3 that will meet that situation?

Mr. MATTHIAS. We will be glad to sponsor it if in the opinion of this committee it is a forward step in the conservation.

The CHAIRMAN. I think you have your finger on a very important point. Now it just happens that I was one of the joint authors of that title 3.

Mr. MATTHIAS. Yes, sir.

The CHAIRMAN. The provision you want was not put in the act when the co-sponsors and I introduced it, because, at the time, it was the only way that we could get the title in the act without running afoul of a positive declaration by the Bureau of the Budget that the entire bill would be vetoed if it included other than the language that is in the act now. I say to you that so far as I am concerned I would welcome the effort on the part of some great organization like yours or a number of them to secure language which will bring about just what you are talking about.

Mr. MATTHIAS. I believe that it is——

The CHAIRMAN. And we are going to have an act next year, you know.

Mr. MATTHIAS. It is a wise move on the part of the Federal Government.

The CHAIRMAN. I will tell you this. The Federal Government is not going to take that move. It is going to have to be moved.

Mr. MATTHIAS. Maybe we can help in moving them.

The CHAIRMAN. All right.

Mr. MATTHIAS. The second item you mentioned, the word, I don't like to use it, but the Bureau of the Budget.

The CHAIRMAN. That is not a word. It is a state of mind and condition.

Mr. MATTHIAS. Nevertheless, whatever it is, we have to contend with it. We have just this year experienced some difficulty with the Bureau in sending over twice the Presidential veto based on the weak excuse of 56 new starts.

The CHAIRMAN. I will say this. They are worse than cotton farming in the second century. I will tell you that.

Mr. MATTHIAS. We feel that the duty lies with the Congress in establishing the formulas of the yardstick by which these projects should be measured. We do not feel that it should be left to some bureau to establish the yardstick and the tools with which the Corps of Engineers, the Bureau of Reclamation, and other agencies have to work.

Congress, in its prosecution of this program, passed the original resolution to begin the survey, they appropriate the money to make the reports, they authorize it, they appropriate the money for construction and we feel that the Congress should be the judge and should establish the ground rules, so to speak, on how these projects shall be evaluated, what the economics of them should be.

The CHAIRMAN. Determining the formula whereby they may be justified in providing for in construction.

Mr. MATTHIAS. Thank you for explaining.

If I may, very briefly I would like to enlarge on that to some extent, on the problem that we have on the Red River.

In the past 25 years, as Mr. Wimberly stated this morning, we lost some 60,000 acres of land adjacent to the river, in many cases the topsoil being 40 to 50 feet deep. That is in Louisiana alone. In the State of Oklahoma, as you well know, Senator, we load Dennison Dam on both the Texas and Oklahoma side.

The CHAIRMAN. If we do not get it fixed Oklahoma is going to be big as Texas some day because you know the boundary is the south bank of that river.

Mr. MATTHIAS. I know. We feel that if you take 10 square miles out of any given State over a period of 25 years, particularly the type of land that it is, we feel that it is almost criminal in allowing that land to go down to the sea in the form of mud and silt, building bars and preventing efficient navigation and its many related problems.

The CHAIRMAN. How many square miles now?

Mr. MATTHIAS. Sir?

The CHAIRMAN. How many square miles?

Mr. MATTHIAS. It amounts to 60,000 acres.

The CHAIRMAN. You said 64,000.

Mr. MATTHIAS. Well, I was figuring 640 to the acreage.

The CHAIRMAN. That would be 100 square miles.

Mr. MATTHIAS. It would be 10 square miles.

The CHAIRMAN. That would be 10 miles square?

Mr. MATTHIAS. It would be 100 square miles.

The CHAIRMAN. That is right.

Mr. MATTHIAS. Now my arithmetic is bad today, Senator, but to take that amount of land, with the quality of soil that it is, and just let it slough off and go down river, surely there must be some economic basis that we can protect that land.

The CHAIRMAN. The fact about the business is we lost more productive soil by the process you are talking about in this country in the last 50 years than would be required to feed all the people in the British Isles.

Mr. MATTHIAS. And still at the same time, Senator, we are developing the western arid lands, we are spending money out there to bring into production lands that never will be of the quality and the productivity and the fertile lands that we have here.

I think this committee could assist us in this problem by checking into how we are evaluating, how we are weighing the economics on our bank stabilization programs, not only the Red but the Arkansas as well. I think it is something that this committee should direct its attention to.

Certainly year by year it becomes increasingly difficult to establish justification for new projects, the formulas which we are operating under, new directives, from day to day. We sometimes find ourselves in the middle of a game and the rules are all changed. So I ask this committee in formulating your final report to take those two items, if you will, please, sir, into consideration.

I think we should be very careful in seeing to it that our projects are sound but under the present conditions it is becoming increasingly difficult to get an authorized project or get a favorable project.

The CHAIRMAN. You know the Senate has already paid its respects to A–47.

Mr. MATTHIAS. Yes, sir.

The CHAIRMAN. If it ever gets to where the House will go along not only will it be ignored, but the fact will be made crystal clear that it had no authentic standing from the beginning.

Mr. MATTHIAS. If we do not do that, we do not clarify this situation, then we are going to see this program grind up to a halt. We cannot conscientiously carry on the future program which we are all dedicated to do and should do under the present rules that we are operating under.

I thank you very much.

The CHAIRMAN. Thank you.

Senator ELLENDER. Thank you.

Mr. WIMBERLY. I would also like to file a statement from the Abbeville Chamber of Commerce at this time.

Senator ELLENDER. Which one?

Mr. WIMBERLY. From the Abbeville Chamber of Commerce.

Senator ELLENDER. All right. Without objection it will be so ordered.

(The statement follows:)

STATEMENT BY ABBEVILLE CHAMBER OF COMMERCE

The following statements will bear out the fact that Vermillion Parish and southwest Louisiana is rapidly approaching a period of time where the need for the use of sweet water will far exceed the present supply unless provisions for future needs are made now. In areas of increased or heavy water withdrawals, such as Lake Charles, water levels continue to decline at a uniform rate from deep wells. About half of the ground-water pumpage in Louisiana is from wells in southwestern Louisiana where the average ground-water use in 1957 was 577 million gallons per day.

The principal fresh water bearing sands of southwestern Louisiana are in the Atchafalaya, Chico, and Evangeline Reservoirs.

For the entire area of southwestern Louisiana the calculated average-ground water withdrawal from the Chicot aquifer for the 12-year period of record (from 1946 to 1957) is about 560 million gallons per day. For the first 6 years of this period the average ground-water withdrawal was 540 million gallons per day, whereas the average ground-water withdrawal for the second 6-year period was 580 million gallons per day. This is an increase of about 8 percent.

The average amount of ground water used for irrigation based on data from 43 wells was 2.2 acre-feet of water per acre of cultivated rice.

Since 1946 there has been a daily increase in daily pumpage of about 120 percent. In 1946 the total amount of ground water used annually for rural supply purposes in southwestern Louisiana has increased from 11.1 billion gallons to 12.1 billion gallons in 1957. Since 1946 the annual pumpage for municipal supply purposes has increased from 7.7 to 12.7 billion gallons in 1957.

(Reference: Water Resources Pamphlet No. 6, Summary of Ground Water Conditions in Southwestern Louisiana, 1957 and 1958, published by Louisiana Department of Public Works in June 1959.)

Rice irrigation requires most of the available ground and surface water in the southwest Louisiana area. During the irrigation seasons from April to August, withdrawals often exceed streamflow and replenishment of ground water. Depending upon local conditions, this results in lowering of the water table, salt water intrusion, and excessive contamination of streams.

Diverting water from the Atchafalaya to be distributed in these areas where the water table has been lowered from year to year would certainly help this situation. It would also insure an adequate supply of fresh water to the generations of people to follow. By 1980 it is estimated that water requirements will increase by 31 percent. During 1956 there was about 432,000 acres of rice planted in southwestern Louisiana, representing approximately $70 million income to the area of southwest Louiisana. The irrigation of these many acres of rice uses about 90 percent of the fresh water in southwest Louisiana, and unless additional water is provided, there will not be sufficient water for municipal and industrial purposes. Should it become necessary to place restrictions on this vast rice industry, with its vast source of income to southwest Louisiana, the economy of the area would be greatly upset.

Among many present and anticipated increasing serious surface and ground sweet water, related and future problems for Vermilion Parish and southwest Louisiana are:

1. Moderate to serious long sustained drought periods locally and over the Mississippi River Valley.

2. Ground-water contamination by salty surface water penetrating the aguifer along the Vermilion River and other area deep channels into our valued but receding ground water pool.

3. An ever increasing serious stream pollution problem in our area.

4. The near future planned control program for Old River modifying the future diversion of Mississippi River sweet water flow down the Atachafalaya River into Atachafalaya, East and West Cote Blanche, and Vermilion Bay.

Our present and future water problems should merit thorough study, wise planning, and timely action if our rich area is to continue to prosper normally. There is a definite need to make provisions now for increased sources of fresh water for the future. The need is urgent. Plans must be made now. The future progress of this area depends upon this vital resource, and we must provide for an ample amount in the future so that generations to follow will be able to enjoy prosperity in a free country.

(Reference: The Louisiana Intracoastal Seaway by the Louisiana Intracoastal Seaway Association, Lafayette, La., 1959. Proceedings of Southern Water Resources for Industry and Agriculture Conference, dated June 16, 1959.)

Hunting, fishing, and pleasure boating is fast becoming the Nation's chief pastime and, for these sports, an abundant supply of water is necessary. An ample supply of water insures the continuation of our fish and waterfowl population at a safe level, both for the demands of the sportsman and that of nature. It is vitally necessary to assure the balance of fish and waterfowl as nature intends. Without adequate water supplies, the balance of nature would be upset and certainly the contribution of the sportsman to the State's economy cannot be overlooked. The economy, not only of Louisiana, but that of the Nation, would most certainly suffer if the facilities needed for the sportsmen were not adequately cared for.

Mr. WIMBERLY. Our next witness, Mr. Chairman, is Mr. Leroy Wilson, commissioner of finance and public utilities, city of Alexandria.

Senator ELLENDER. All right, Mr. Wilson. Come forward, sir. Proceed.

STATEMENT OF LEROY WILSON, COMMISSIONER, FINANCE AND PUBLIC UTILITIES, CITY OF ALEXANDRIA

Mr. WILSON. Senator Kerr, my name is Leroy G. Wilson, commissioner of finance and public utilities, city of Alexandria.

I wish to state at this time that I intend to file a brief during the allocated time but I wish to make a résumé of the brief at this time.

The City of Alexandria Water Department serves a present estimated population of 48,000 to 50,000 with a present firm production capacity of 7.5 million gallons per day. The maximum day in 1959 is 8.1 million gallons as compared to 4.6 million gallons required in 1949 and an estimated 14.9 million gallons per day to be required in 1980 to serve an estimated population of 80,000.

It is obviously necessary to develop a supply of an additional 7.5 million gallons per day to meet the 1980 requirements of 14.9 million gallons per day and with a potential to satisfy a possible year 2000 demand of 20 million gallons per day maximum.

The city of Alexandria has, under "special-use permit" granted by the Kisatchie National Forest under regulation U–10, some 36,000 acres to be used for the development of this supplementary supply.

Based on the findings of Black & Veatch, consulting engineers, and recent test-hole program in the area (a program which is being extended at this time) the requirements stated above may be met by drilling wells and designing a system which will be capable of supplying 20 million gallons per day. Cost estimates supplied by the engineer indicate that approximately $3 million will be required to

initiate this program and it is the city's intent to finance this development through revenue and ad valorem bonds, if possible.

Because aquifers in this and other similar areas are recharged, primarily by rainfall, it is emphasized that a continued supply of water for Alexandria and other communities is contingent upon proper management of the forested watersheds and I believe that one of the primary obligations of the Federal Government in a study of this sort should be to guarantee the best watershed protection and management on federally owned lands.

An alternate or additional source of supply, particularly for replacement of wells now and ultimately allocated to England Air Force Base, has been suggested probably north and west of the existing McNutt Well Field. There are no current cost estimates on this development and a more detailed study will be necessary to determine its feasibility.

I want to take this opportunity of thanking Senator Kerr and Senator Ellender for allowing me to come here this afternoon.

Thank you.

Senator ELLENDER. Thank you. Glad we had you, Mr. Wilson.

Mr. WIMBERLY. Is Mr. Sumter D. Marks, Jr., here or somebody representing him?

Senator ELLENDER. Permission will be given that he supply the statement.

Mr. WIMBERLY. Thank you, Mr. Chairman.

(The statement referred to above follows:)

STATEMENT BY SUMTER D. MARKS, JR., PRESIDENT, CHAMBER OF COMMERCE OF THE NEW ORLEANS AREA

As president of the chamber of commerce of the New Orleans area, I represent a nonprofit, community organization dedicated to the economic development of the Mississippi Valley, the State of Louisiana, and metropolitan New Orleans. This organization is composed of more than 5,200 members, representative of the business and professional life of the New Orleans area. Its membership includes nearly 2,800 corporations, partnerships, and proprietorships. The chamber of commerce of the New Orleans area from its beginning has undertaken a vigorous program to develop economic improvement, waterborne commerce in the Mississippi Valley, and foreign trade with all countries of the world.

The Mississippi River, comprising 15,000 miles of navigable waterways serving the vast midcontinent area of the United States, has been and will continue to be one of the most important transportation arteries, responsible for development of 51 percent of the Nation's land area, the Deep South segment of the United States, with a consequent impact on the development and expansion of world markets. The resultant commerce contributes heavily to the progress of the entire U.S. economy.

In the present era of unsettled and delicate international relations, the Mississippi River Valley waterways system is a most important consideration in national defense plans. This fact in itself justifies careful consideration and planning designed to develop the economic use of this river system and its vital supply of water for agriculture, human resources, industry, and wildlife to the maximum extent.

The chamber of commerce of the New Orleans area realizes fully the importance of recommendations and decisions that may be reached as a result of these hearings. We regret that, because of limited time, detailed studies could not be developed to meet the specific requests of the committee.

In lieu thereof, we present a brief analyses of the various subjects, included as exhibits A through H in this report. The exhibits are confined to 11 Louisiana parishes (counties) either bordering or divided by the Mississippi River from Baton Rouge to the mouth of the Passes. These parishes (counties) are named

from north to south as East Baton Rouge, West Baton Rouge, Iberville, Ascension, St. James, St. John the Baptist, St. Charles, Jefferson, Orleans, St. Bernard, and Plaquemines.

In addition, certain economic projections to 1970 have been extracted from a report titled "The Economic Potential of the New Orleans Area, 1956–70" prepared by the Tulane Society of Economics. These data are based on the five parishes (counties) of Jefferson, Orleans, St. Bernard, Plaquemines, and St. Charles that comprise a closely knit economic unit defined as the New Orleans area.

The Chamber of Commerce of the New Orleans area in this presentation has prepared economic projections of the 11 Louisiana parishes (counties) from Baton Rouge to the mouth of the Passes for the year 1970 with numerical and percentage comparisons with 1960. The sources of basic data are the United States Department of Commerce and the Annual Surveys of Buying Power published by Sales Management. Care has been exercised to develop conservative figures using accepted and scientific techniques.

In reports of this type certain assumptions must necessarily be made as follows:

1. There will be no major war during the next 15 years.
2. Military requirements of the Federal Government will not be drastically altered prior to 1975.
3. The economy of the United States will not experience either a serious and prolonged inflation or depression during the next 15 years.
4. The present trends toward industrial decentralization and suburbanization will continue.

The following analyses are based on exhibits A through H.

POPULATION PROJECTIONS

Population in 1975 will be 1,551,000, a 27.2 percent increase from the 1960 figure of 1,219,000. This percentage increase is 2.6 percent above the anticipated national gain. (See exhibit A.)

URBAN, RURAL NONFARM, AND RURAL FARM POPULATION PROJECTIONS

During the postwar period, the 11 parish (county) area has been the site of rapid industrialization. Many economic authorities have termed it as the developing "Ruhr Valley of the United States." Population characteristics have changed rapidly and this trend will be accelerated in the future. Urban population in 1975 is estimated at 1,521,500, a dramatic gain of 34.9 percent from 1960. The increased density of population created by industrial expansion with growing urbanization is reflected in a projected decrease of 62.7 percent in rural nonfarm population and 85 percent in rural farm population. (See exhibit B.)

LABOR FORCE PROJECTIONS

The total civilian labor force, discounting any migration from outside areas, should reach 644,800 in 1975, an increase of 27.2 percent by comparison with the 1960 figure of 506,800.

Total employment is expected to increase at the same percentage rate. Therefore, the number of people gainfully employed in 1975 should approximate 589,300, a numerical gain of 126,100 people from 1960. A realization of this projection shows that 91 of every 100 people in the civilian labor force would be gainfully employed in the 11 Louisiana parishes (counties) in 1975.

Employment and manufacturing, estimated at 122,100 in 1975, is 34.2 percent above the 1960 figure of 91,000. It is a 7 percent higher gain than the total employment increase, and emphasizes the rapid growth trend in new and expanded manufacturing plants in the Baton Rouge-New Orleans industrial complex.

Due to changing economic characteristics of the area, agricultural employment will decline from 10,500 in 1960 to 9,700 in 1975, a percentage loss of 7.6 percent. (See exhibit C.)

MANUFACTURING PROJECTIONS

The following projections are probably underestimated to a considerable degree, particularly as monetary figures are expressed in terms of 1960 dollars. No provision has been made for inflationary influences during the 15-year period to 1975.

As the prevailing trend is toward larger plants, the number of manufacturing plants in 1975 should approach 1,700, a gain of 34.1 percent over 1960. This expansion should substantially exceed the national percentage increase.

The number of employees engaged in manufacturing is expected to increase from 91,000 in 1960, to 122,100 in 1975, a percentage increase of 34.2 percent.

Salaries and wages should increase at a much faster rate than either the number of new manufacturing establishments or number of employees. An expected increase of 112.4 percent would raise the salary and wage figure from $410,228,000 in 1960, to $871,346,000 in 1975.

Value added by manufacture is projected at $1,407,667,000 in 1975, a significant improvement of 76.4 percent from the 1960 figure. (See exhibit D.)

PROJECTIONS OF CAPITAL INVESTMENT IN NEW AND EXPANDED MANUFACTURING PLANTS

Federal Government statistics during the postwar period have shown that States defined as the Deep South have had a greater manufacturing development and expansion than other sections of the United States. This phenomena has been particularly true in the 11-parish (county) area covered by this report.

Capital investment in land, buildings and fixed equipment has been reported at nearly $1.5 billion during the period from 1946 to 1960. A projection to 1975 based on the same rate of growth (which should accelerate) develops a conservative estimate of an additional $1.5 billion of capital invested in new and expanded manufacturing facilities from 1960 to 1975. It represents a 100 percent increase in the 15-year period beginning in 1960 as compared with the span from 1946 to 1960. (See exhibit E.)

WATERBORNE COMMERCE PROJECTIONS

An analysis of waterborne commerce on the Mississippi River from 1935 through 1955 shows that between 75 to 78 percent of the total traffic from Minneapolis to the mouth of the Passes traverses the segment between Baton Rouge and the Gulf of Mexico.

Total waterborne commerce from Minneapolis to the mouth of the Passes is projected at 246,390,000 short tons in 1975, an increase of 86.5 percent from 1960. Due to the anticipated rate of economic expansion in the Baton Rouge-New Orleans industrial complex, the percentage increase of river traffic in this segment of the river during the next 15 years, should be at a faster rate of approximately 91.2 percent. Therefore the total waterborne commerce figure would be 194,139,000 short tons in 1970 as compared with 101,559,000 in 1960. (See exhibit F.)

PROJECTIONS OF COMBINED WATERBORNE COMMERCE OF THE PORTS OF BATON ROUGE AND NEW ORLEANS

Total waterborne commerce of the ports of Baton Rouge and New Orleans should increase to 151,221,000 short tons in 1975. This is a substantial gain of 75.7 percent from the 1960 figure of 86,050,000 short tons. During the 15-year period from 1960 to 1975, exports and imports tonnage should increase by 40.1 percent; coastwise traffic by 41 percent; internal traffic (river shipments) by 109.4 percent; and intraport and local traffic by 34.5 percent. Particular attention is invited to the fact that the expected gain in internal tonnage is 1¾ times the rate of increase in both exports and imports, and coastwise shipments. (See exhibit G.)

PROJECTIONS OF ECONOMIC GROWTH FACTORS

Effective buying income of residents of the 11-parish (county) area is projected at $4,209,400,000 in 1975, more than double the 1960 figure of $2,093 million.

Retail sales should follow the same pattern and are estimated at $2,723,500,000 in 1975, by comparison with $1,354,200,000 in 1960. (See exhibit H.)

The Tulane Society of Economics, as previously stated, compiled and published a report titled "The Economic Potential of the New Orleans Area, 1956–70." The scope of the report was restricted to the five parishes (counties) of Jefferson, Orleans, Plaquemines, St. Bernard, and St. Charles. As this economic unit either borders on or is divided by the Mississippi River in the

New Orleans area, the following conclusions are revelant to the subject and they are quoted below:

POPULATION

The total population of the 5-parish area in 1970 is projected at 1,097,100, an increase of 278,100 persons over the 1956 population or 36 percent, compared to a national gain of 21 percent.

The greatest relative increase, 85 percent, is seen in the college-age population; that is, between the ages of 18 and 24. The number in the secondary school-age groups, 14 through 17 years, is expected to increase about 74 percent.

The adult age group from 25 through 44 years of age will exhibit the smallest relative gain of the age groups studies, increasing only 14 percent over 1956.

PRODUCTION

Total production of the New Orleans area should rise by 67 percent from 1956 to 1970. This increase in the total value of goods and services produced would result from continuation of long-term upward trends in productivity per man-hour and employment, coupled with a further decline in the average length of the typical working week.

The value added by manufacture should approximately double between 1954 and 1970.

The areas' output of crude petroleum may increase 80 to 100 percent by the year 1970.

INCOME AND CONSUMER DEMAND

Assuming no change in personal tax rates, disposable personal income received by the area's residents should rise by 67 percent, to match the increase in output. The sales of retail stores are expected to register a somewhat smaller increment, because savings are assumed to increase somewhat over their present rates. On a per capita basis, these projections point to an average gain of about 23 percent in real income per member of the population.

HOUSING

The annual demand for new housing units in the community will fluctuate around a gradually rising level which will reach approximately 8,500 new units per year in 1970. A somewhat higher level of residential building would be required to provide suitable housing for all the area's families. Estimates are presented in the report for the need for new housing as well as for the expected demand on the basis of population and income.

PORT ACTIVITY

The dollar value of foreign trade moving through the port of New Orleans is projected at 84 percent more than its 1956 value, with imports making up the greater share of the total increase. Exports are estimated at 63 percent over 1956 and imports at 124 percent more. These projections assume that United States foreign trade will continue to grow roughly in step with overall gross national production, and that the port of New Orleans will maintain the share of the Nation's trade that it has held on the average in recent years.

FINANCIAL INSTITUTIONS

The impact of growth on local financial institutions will be significant. They will be called upon for additional credit to finance the needs of the growing economy. An increase of around 60 percent in demand deposits of the areas' banks is projected. Savings institutions may expect to attract a somewhat larger portion of the personal income received in the area than they do at present.

The purpose of this presentation is to show the projected economic growth of the area as previously defined. Benefits resulting from a progressive program of improved national water resources in this part of the Mississippi River system will not be confined to communities located within the Louisiana area but will also implement and improve economic health and national defense facets of the United States as a whole.

We sincerely hope that members of the Select Committee on National Water Resources will evaluate the data set forth in this report; that the information

will be useful in the study of this complex subject; and that justification for the appropriation of Federal funds required for the project will be clearly established.

EXHIBIT A.—*Population projections*

	1960	1975	Percent change
11 Louisiana parishes	1,219,000	1,551,000	+27.2
United States	177,800,000	221,500,000	+24.6

Sources: 11 Louisiana parishes, Chamber of Commerce of the New Orleans Area; United States, U.S. Department of Commerce.

EXHIBIT B.—*Urban, rural nonfarm, and rural farm population projections*

	1960	1975	Percent change
11 Louisiana parishes:			
Urban	1,127,600	1,521,500	+34.9
Rural nonfarm	70,700	26,400	−62.7
Rural farm	20,700	3,100	−85.0

Source: Chamber of Commerce of the New Orleans Area.

EXHIBIT C.—*Labor force projections*

	1960	1975	Percent change
11 Louisiana parishes:			
Population, 14 years old and over	903,300	1,149,300	+12.7
Total civilian labor force	506,800	644,800	+27.2
Total employment	463,200	589,300	+27.2
Agriculture employment	10,500	9,700	−7.6
Manufacturing employment	91,000	122,100	+34.2

Source: Chamber of Commerce of the New Orleans Area.

EXHIBIT D.—*Manufacturing projections*

	1960	1975	Percent change
11 Louisiana parishes:			
Number of manufacturing establishments	1,268	1,700	+34.1
Number of employees	91,000	122,100	+34.2
Salaries and wages	$410,228,000	$871,346,000	+112.4
Value added by manufacture	$798,109,000	$1,407,667,000	+76.4

Source: Chamber of Commerce of the New Orleans Area.

EXHIBIT E.—*Projections of capital investment in new and expanded manufacturing plants*

	1946–60	1946–75	Percent change
11 Louisiana parishes: Capital investments	$1,486,125,000	$2,972,250,000	+100

Source: Chamber of Commerce of the New Orleans Area.

EXHIBIT F.—*Waterborne commerce projections*

	1960	1975	Percent change
Mississippi River from Minneapolis to the mouth of the passes.....short tons	132,129,000	246,390,000	+86.5
Baton Rouge to the mouth of the passes.....do	101,559,000	194,139,000	+91.2
Percentage of total tonnage of the Mississippi River traversing the segment from Baton Rouge to the mouth of the passes	76.9	78.8	+1.9

Source: Chamber of Commerce of the New Orleans Area.

EXHIBIT G.—*Projections of combined waterborne commerce of the ports of Baton Rouge and New Orleans*

[In short tons]

	1960	1975	Percent change
Total exports and imports	16,790,000	23,531,000	+40.1
Total coastwise traffic	18,606,000	26,242,000	+41.0
Total internal traffic	44,462,000	93,106,000	+109.4
Total intraport and local traffic	6,201,000	8,342,000	+34.5
Total waterborne commerce	86,050,000	151,221,000	+75.7

Source: Chamber of commerce of the New Orleans Area.

EXHIBIT H.—*Projections of economic-growth factors*

	1960	1975	Percent change
11 Louisiana parishes:			
Effective buying income	$2,093,000,000	$4,209,400,000	+101.1
Retail sales	1,354,200,000	2,723,500,000	+101.1

Source: Chamber of Commerce of the New Orleans Area.

Our next witness is Mr. Nathan Levy.

Mr. Levy.

STATEMENT OF NATHAN LEVY, CHAIRMAN, WATERWAYS COMMITTEE, ST. MARY PARISH

Mr. LEVY. Senator Kerr, Senator Ellender and Congressman McSween, I am chairman of the Waterways Committee of St. Mary Parish.

We want to thank you for allowing us to get our report in. We do not have it. We will have it in your hands before January 15. This is a partial report.

(The report is as follows:)

Whereas a U.S. Senate Committee on National Water Resources is conducting one of its 19 field hearings in Alexandria, La., (Dec. 1) concerning procedures for insuring the proper use of water and to assure the necessary supply of usable water for population, agriculture, recreation, and industry, and

Whereas the hearing is desirous of securing information that would be helpful in considering water resources policies for the future: Therefore be it

Resolved, That a committee of this police jury of the parish of St. Mary attend the hearing of the U.S. Senate committee and present such facts as are related to the water problems of our area; and be it further

Resolved, That the hearing be advised of the fact that flood control and transportation are not the only considerations in our area, but that other problems have arisen, such as fresh-water conservation and salt-water intrusion, etc.; and be it further

Resolved, That as St. Mary Parish has the only other outlet of the great Mississippi River, which drains 41 percent of the area of the United States, it is deserving of special consideration in the water development program of the Mississippi Valley.

I, May Belle B. Hiemstra, secretary of the Police Jury of St. Mary Parish, La., do hereby certify that the foregoing is a true and correct copy of the resolution adopted by the Police Jury of St. Mary Parish in regular session on November 12, 1959, at which meeting a quorum was present.

Given under my official signature and seal of office this 18th day of November 1959.

MAY BELLE B. HIEMSTRA,
Secretary, Police Jury of St. Mary Parish, La.

Mr. LEVY. We will have a detailed report for you, Senator.
Thank you very much.
(The resolution and brief referred to follow:)

RESOLUTION OF POLICE JURY, ST. MARY PARISH, FRANKLIN, LA.

Whereas a hearing was held at the Bentley Hotel, Alexandria, La., on December 1, 1959, before the Senate Select Committee on National Water Resources, and

Whereas permission was granted to the St. Mary Parish Police Jury to file a brief concerning the above subject not later than January 15, 1960: Now, therefore, be it

Resolved, That the St. Mary Parish Police Jury accept the statement prepared by the waterways committee chairman and the parish engineer and forward same to the Senate Select Committee on National Water Resources, U.S. Senate, Washington, D.C., attention Senator Robert S. Kerr, chairman.

I, May Belle B. Hiemstra, secretary of the police jury of St. Mary Parish, La., do hereby certify that the foregoing is a true and correct copy of the resolution adopted by the police jury of St. Mary Parish in regular session on January 13, 1960, at which meeting a quorum was present.

Given under my official signature and seal of office this 13th day of January 1960.

[SEAL]

MAY BELLE B. HIEMSTRA,
Secretary, Police Jury of St. Mary Parish, La.

STATEMENT FROM ST. MARY PARISH POLICE JURY, ST. MARY PARISH, LA., ON NATIONAL WATER RESOURCES

GENTLEMEN: We respectfully present our position with reference to the subject matter of your committee, which we understand concerns procedures for insuring the proper use of water and the assurance of the necessary supply of usable water for population, agriculture, industry, and recreation.

St. Mary Parish is located in south central Louisiana on the Gulf of Mexico, having a land area of approximately 387,200 acres, and 104 square miles of inland waters. It is bordered on the south and southwest by the Gulf of Mexico, on the north and northwest by Iberia Parish, on the northeast by St. Martin Parish, on the southeast by Terrebonne Parish, and on the east by Assumption Parish.

St. Mary Parish occupies part of three deltas of the Mississippi River, each of which has built up from alluvial materials derived from different sources and deposited during different ages. The alluvium was left by the Red River, the Mississippi River, and by the combined Mississippi and Ohio Rivers during the time that these streams flowed through the channel now occupied by Bayou Teche.

First the natural levee ridges have been built up from alluvial sediments deposited along Bayou Teche, Bayou Cypremort, Bayou Sale, and other large and small streams. They range in elevation from near gulf level to 16 feet.

Second the coastal-marsh areas extend up to 10 miles inland from the gulf. They range in elevation from gulf elevation in the southern part to 1 to 2 feet in the northern and interior part.

Third the rolling to hilly areas over salt domes occurs in the southern part of the parish with elevation ranging from marsh level to more than 100 feet. The salt domes occur in two isolated areas within the coastal marshes, namely Cote Blanche Island, and Belle Isle.

The Atchafalaya River, which flows into the Gulf of Mexico, is the principal stream in the parish. This river enters the parish from the northwest. At present the Atchafalaya River is depositing alluvial sediments over a large delta in the Grand and Six Mile Lakes and along its entire course through Berwick Bay, the lower Atchafalaya River, and into the gulf.

Another stream in the parish is Bayou Teche, entering the parish from the northwest, following a winding course about 42 miles and combines with a once active segment of the Lower Atchafalaya River near Patterson. The combination of the winding Teche and Atchafalaya River being approximately 66 miles in length.

Other navigable streams in the parish are Bayous Boeuf, Chane, and Shaffer, all flowing toward the gulf.

Manmade canals in the parish are Charenton and Hanson Canals extending from Bayou Teche to the gulf, and Wax-Lake Outlet Canal extending from Six Mile Lake (Atchafalaya River) to the gulf, and the Intracoastal Waterway crossing the parish in the northern part of the coastal-marsh area from east to west.

It was because of its location, that St. Mary Parish was given an entity of its own, when the 64 parishes of the State were divided into 26 drainage districts and the parish was designated a district of its own. We are convinced that an analysis of our water situation will convince the Federal authorities that our parish has a particular relationship to most of the United States, where the water problems of other States can aggravate our own.

The position of St. Mary Parish is very different from the other coastal parishes and our water problems are far greater and more complicated than those found elsewhere. The reason for this is that in addition to the ordinary problems of drainage, water supply, irrigation, and navigation we are at the bottom of a vast flood control project, namely the Atchafalaya Basin Floodway.

All of the waters of the Great Mississippi Valley, which do not pass by way of New Orleans, find an outlet to the gulf through St. Mary Parish by way of the Atchafalaya River and the Wax-Lake Outlet.

After the flood of 1927, the U.S. Engineers commenced work on flood control on the Atchafalaya Floodway, and now, almost completed, has shown untold benefit to our parish, however, in constructing the floodway, there were brought about many problems as listed:

1. Depletion of fresh water in Bayou Teche from the Keystone Dam to the Wax-Lake outlet and from the Wax-Lake outlet to Patterson.

2. Intrusion of salt water in Bayou Teche by construcing the Charenton drainage canal and the closure of the Verdunville Canal, Lake Fausse Pointe and Lake Dauterive and the Lower Atchafalaya River at Patterson on the west Atchafalaya Basin protection levee.

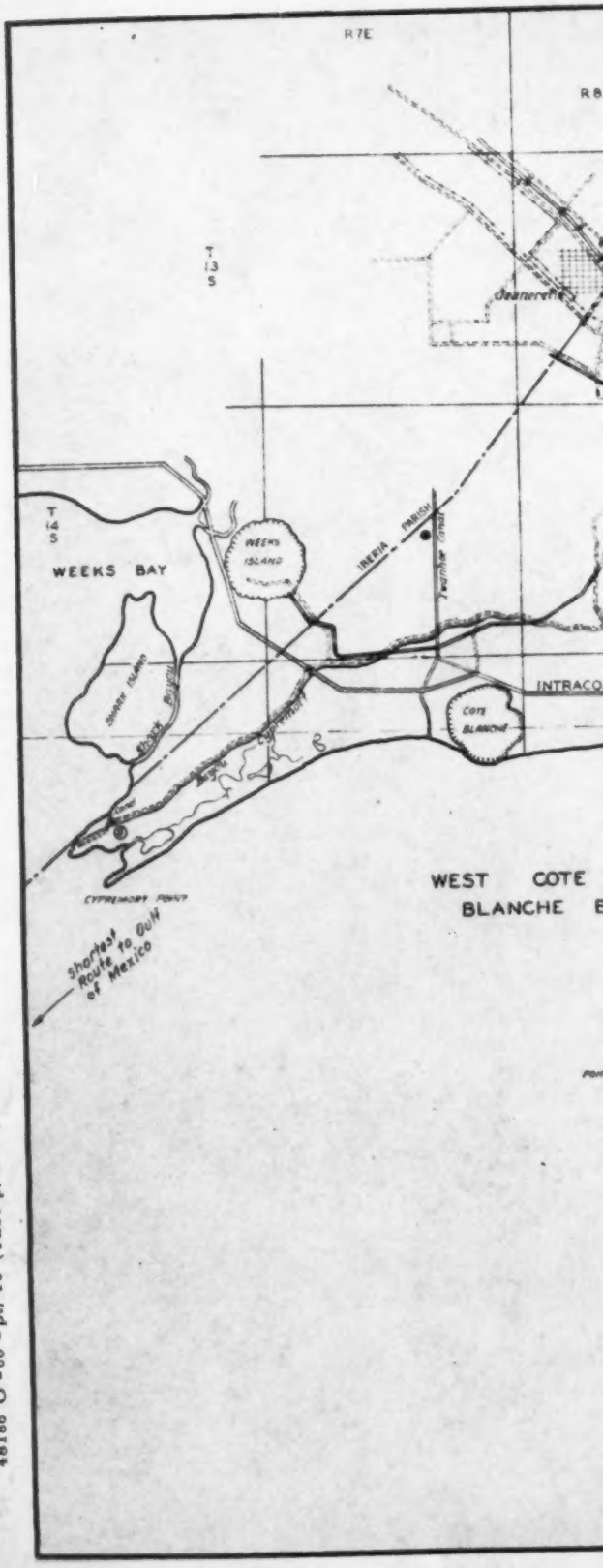
3. The depsit of alluvial sediments in Grand and Six Mile Lakes and along the Lower Atchafalaya River and in the Gulf of Mexico at navigable entrance to the parish.

4. Destroyed our natural fresh water lakes for recreational purposes.

We believe that solving the above water problems should be the responsibility of the Federal Government.

Efforts in the past in connection with water have been mostly confined to transportation, flood control and drainage. Newer considerations have been irrigation, local fresh water supplies for the population, water for industrial purposes, for wildlife and fisheries and recreation.

The oil and gas production of St. Mary Parish together with the vast similar reserves of the Gulf of Mexico at the shoreline of the parish invite the processing



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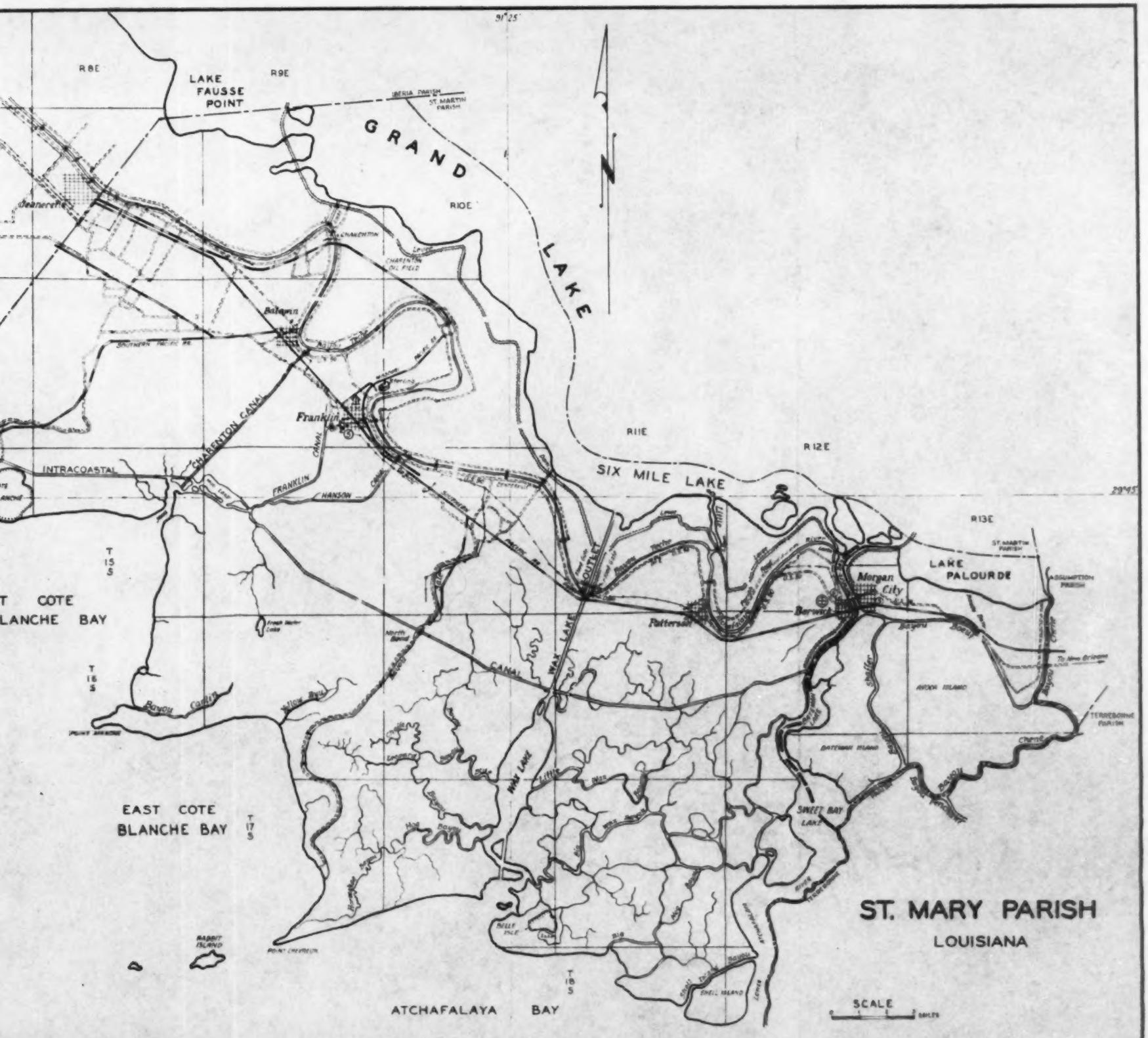
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of these petroleum products. Thus there is need of fresh water for industrial development, and the prevention of salt water intrusion.

We therefore earnestly urge that due consideration and study be given the following recommendations:

1. Continued maintenance dredging of Bayou Teche and control of flow over the Keystone Dam.
2. Derive ways and means of supplying fresh water in Bayou Teche at Franklin, La., and in the Lower Atchafalaya River at Patterson, La.
3. Study the deposit of alluvial sediments in our lakes, in rivers, and in the Gulf of Mexico.
4. Construction of a flood control structure in the Charenton drainage canal near the Intracoastal Canal in order to combat the intrusion of salt water in Bayou Teche.
5. Continued maintenance completion of the Atchafalaya River navigation channel through Grand and Six Mile Lakes, from Morgan City to the Mississippi River via the Atchafalaya and Old Rivers.
6. Improvement of the Lower Atchafalaya River from Morgan City to the Gulf of Mexico for deep water navigation.
7. Completion of the Gulf Intracoastal Waterway, Morgan City to Port Allen, La.
8. Improvement of the Intracoastal Waterway to ship channel dimensions.
9. Development of recreational areas in the parish.

The Louisiana Department of Public Works is a State agency and is responsible for coordinating the development of our water resources. We, therefore quote a paragraph from a brief presented to the Select Committee on National Water Resources of the U.S. Senate, held in Alexandria, La., on December 1, 1959, by Mr. Lorris M. Wimberly, director of department of public works, State of Louisiana.

"We believe that the solving of Louisiana's major water problems is a responsibility of the Federal Government. We believe this because they are created either by the waters from almost one-half of the United States flowing through Louisiana to the sea and by the necessity of providing and maintaining the navigation link between mid-continent America and markets of the world. Throughout the history of the United States, Louisiana, because of its willingness and its strategic position has contributed as no other State has to the growth and development of the United States. With the help of the Federal Government we will continue to do so."

Senator ELLENDER. Thank you very much.

Mr. WIMBERLY. The next witness is Mr. Harry K. McLemore. Is Mr. McLemore here?

Mr. McLemore.

STATEMENT OF HARRY McLEMORE, MANAGER OF THE INDUSTRIAL DIVISION OF THE SHREVEPORT CHAMBER OF COMMERCE

Mr. McLEMORE. I would like to present a statement on behalf of the board of directors and members of the industrial division of the Shreveport Chamber of Commerce. It relates to this organization's position on future navigational policy in the United States. We feel that Shreveport has a direct interest in a sound and workable water policy, and for this reason we desire to make the following statement.

Shreveport was originally founded because of its superior water transportation facilities. Its location as a major port on the Red River made it a focal point for trade, manufacturing, and transportation. Railroad competition, bank caving, and channel shoaling in

the late 1800's caused navigation to decline. About 1902 it ceased, and so remains today.

This chamber of commerce has long been an advocate of water transportation for the area it represents. During the past years at numerous times it has vigorously and aggressively called public attention to the merits of such transportation for the Red River Valley. It has observed with alarm the loss of this area's competitive advantages for securing new business and industry because of the lack of this transportation. The chamber has noted with concern the freight rate differential involved in the shipment of many goods to and from communities with water transportation near our city as compared with Shreveport freight rates. It is our feeling that in many cases such a differential has been detrimental to our development.

We have watched with alarm and sadness some of our finest local industries depart for water transportation sites. We have noted in other instances where local industry has virtually been eliminated from some rich markets due to the lack of navigational facilities. In our dealings with prospective industries, we have seen an increased consciousness on their part of the desirability of sites affording navigational rate advantages.

In a time when competition is keen for economic advancement by industry, by communities, and by National Governments, we believe that increased navigation facilites would be of great value.

Located on a large river, we are constantly reminded of the need for effective flood control, bank stabilization, soil conservation, municipal and industrial water supply, waste disposal, and the other phases of water development. All of these problems should be considered along with a navigational program so as to provide maximum benefit from expenditures. We know of the vast and complex problems involved in an overall water policy, and we feel that there is no time to be lost in coming up with a sound and comprehensive program for the future.

The industrial division, Shreveport Chamber of Commerce, knows that the opening of the Red River for navigation would provide considerable benefits for the north Louisiana area. These benefits cannot be measured just in the immediate future. They will be far reaching and will determine to a great extent the future development and complexion of the entire area.

We realize that in many cases direct benefits are sometimes slow in accruing from expenditures for navigational purposes. However, the primary and secondary impact of water transportation is of such vital importance to any area that we feel every practical method should be undertaken to encourage the navigational development of major waterways such as the Red River.

It is the view of this organization that the future growth and development of Shreveport is irrevocably tied to the development of the U.S. economy as a whole. While representing only our membership we nevertheless feel that the policy established by the Congress of the

United States will vitally affect all persons living in this city and area.

The industrial division, Shreveport Chamber of Commerce, believes that the navigational facilities of this country, both deep water, coastal, and inland should be developed to the utmost.

It further feels that future navigational projects only be undertaken where they are economically justified. It further believes that each proposed project should be selected solely on the merits of its overall contribution to the economy and its direct return on investment.

The Shreveport Chamber of Commerce is of the opinion that the development of navigation as far as possible is the responsibility of the State and local governments with the assistance of the Federal Government where practical.

We feel such assistance is both necessary and desirable from the standpoint of the standardization on a nationwide program. At the same time we feel that the State and local bodies should be primarily responsible for the promotion and management of these projects. The industrial division, Shreveport Chamber of Commerce, feels that these State and local bodies can plan, develop, and operate these navigational facilities with more economy, efficiency, and dispatch than if the Federal Government takes the prime position in their development.

We cannot stress too greatly the importance of providing a sound, economical, long-range policy for the navigation and water resources of the area which we represent. As we earlier stated, we feel that our progress is directly tied to the progress of the country as a whole. Therefore, such a policy should apply to the entire country with proper deviations to fit local conditions.

Gentlemen, I appreciate the opportunity of appearing.

Are there any questions?

The CHAIRMAN. Yes. Is it your position that the navigation of the Red River should be provided on a——

Mr. MCLEMORE. Senator, we have taken a position going back many years on that provided it is economically justified in yardsticks that are used throughout the country. We feel navigation should be restored on the Red River if possible.

The CHAIRMAN. I don't know just exactly what you are recommending.

Mr. MCLEMORE. We take the position that we are not in a position as an organization to say whether or not navigation is possible. If it is possible——

The CHAIRMAN. Let me say this to you.

Mr. MCLEMORE. Pardon me?

The CHAIRMAN. I do not have the benefit of a technical education but neither have I ever been limited by one. Therefore, I unhesitantly say to you that it is possible and as far as I am concerned I would be glad to have your opinion based on that assumption.

Mr. MCLEMORE. Is it economically justifiable?

The CHAIRMAN. Well, now, as I said a while ago, I speak only for myself.

Mr. MCLEMORE. I believe, Senator, that the Corps of Engineers has in their latest report, which was, I believe, in 1947, stated it was economically justified.

The CHAIRMAN. If we never built the railroads until we had the traffic for them we would not have many.

Mr. MCLEMORE. We take the position if the Corps of Engineers recommends it, sir, we are in favor of it.

Senator ELLENDER. As I recall, the Corps of Engineers did recommend the so-called Overton Canal.

Mr. MCLEMORE. That is correct.

Senator ELLENDER. And there was a resurvey made and as far as the local contribution was concerned it was necessary to put it to the vote of the people. As I recall, the people voted it down, am I correct in that?

Mr. MCLEMORE. I believe, Senator Ellender, that that is correct. That vote was made before the resurvey was made. As I recall, the parish directly involved in this waterway was in favor of it.

Senator ELLENDER. Yes, sir. In order to be able to obtain sufficient funds to make the local contribution, it would be necessary to obtain those funds from some source within the State. Unless that is done I doubt that it would be able to get the Congress to go ahead with it.

Mr. MCLEMORE. I understand.

Senator ELLENDER. If the picture changes as I indicated this year, as well as last year, if I am still the chairman of the Public Works Subcommittee of the Appropriations Committee, I shall do what I can in order to get the Federal Government interested in it to the end that the project will be constructed.

Mr. MCLEMORE. Thank you, sir.

The CHAIRMAN. I will say this to you, you have the strongest champion in the Senate, the gentleman here on my left.

Mr. MCLEMORE. We understand that.

Senator ELLENDER. All right.

Mr. WIMBERLY. Our next witness, Mr. Chairman, Mr. Sam Thompson, chairman of the Board of Water Commissioners, State of Mississippi.

Senator ELLENDER. All right. Sam, how are you?

STATEMENT OF SAM THOMPSON, CHAIRMAN, BOARD OF WATER COMMISSIONERS, STATE OF MISSISSIPPI

Mr. THOMPSON. Mr. Chairman, I am Sam Thompson of the Mississippi Board of Water Commissioners, the State agency which administers our State water rights laws.

I have a prepared statement by Mr. Rex McRaney, who is the director of the Mississippi Game and Fish Commission which I would like to submit for the record at this time.

Senator ELLENDER. The statement will be put in the record at this point.

(The statement follows:)

STATEMENT OF THE MISSISSIPPI GAME AND FISH COMMISSION, PRESENTED BY REX MCRANEY, EXECUTIVE DIRECTOR

The Mississippi Game and Fish Commission, organized in 1932, is this State's agency charged with responsibility for the protection and management of fish and wildlife resources and the administration of stream pollution laws. As such we are vitally interested and concerned with water problems. Your committee will also receive a statement from our State board of water commissioners, which has the responsibility for administration of our recently enacted laws governing the beneficial use of water.

We feel that our commission has a very progressive and popular fish and wildlife conservation program that is based on sound principles. At the same time we are continually aware of trends in outdoor recreational use that cause us considerable alarm. Our State has enjoyed higher individual income and with this increased income shorter workweeks have greatly accelerated demands for outdoor recreation. Mississippians have a very intense interest in outdoor recreation and although we have not had the great population increases experienced by some other States, there has been a considerable shift of populations to urban centers. The increased development of urban areas is causing more stream pollution problems from municipal and industrial wastes. Mississippi is also experiencing rapid growth in the development of oil and gas fields which has added considerably to the problem of keeping our water clean.

Our greatest concern in regard to water problems is the fact that our natural water areas and wetlands are dwindling under the impact of flood control and drainage programs already completed, under construction, or planned. Our principal concern at this time is the preservation and development of natural wetland areas for fish and wildlife purposes. This can be accomplished in many instances only by purchasing land and we are making plans for buying key areas of wetland habitat for fish and waterfowl restoration projects.

We feel that the encroachment of Federal or federally subsidized drainage and flood control programs have already resulted in the loss of too much of our natural wetlands that are our best fish and wildlife habitat. The effects of these programs have not been totally bad but we feel that we have reached the limit of encroachment on wetlands that should be dedicated to timber production and outdoor recreational use. Restoration and reclamation of wetland areas for recreational use will be an important part of our game and fish program for years to come.

Action of the Congresses during the past several years has brought about new and corrective legislation which promises to bring about relief from losses to our fish and wildlife habitat. I refer to four pieces of legislation as follows:

1. The Fish and Wildlife Coordination Act.
2. The Small Watershed and Flood Prevention Act.
3. The Federal Boating Act.
4. The Federal Water Pollution Act of 1956.

We believe that conscientious adherence to the provisions in the four programs in the pieces of legislation mentioned above will help give outdoor recreation interests fair consideration. Fish and wildlife losses occasioned by Federal civil works and private projects can be offset by fish and wildlife developments planned into existing projects. We are pleased that the Watershed and Flood Prevention Act was amended to provide for Federal cost sharing of fish and wildlife developments built into these projects. Thirdly, the Federal Boating Act is stimulating uniform legislation by the States and we expect our next legislative session to provide water safety laws. And last, we are glad that the municipal sewage treatment works construction grants program is being increased under provisions of the Federal Water Pollution Control Act of 1956. We shall be pleased if these four programs are carried out in the manner intended.

Senator ELLENDER. Will you highlight it, what you have?

Mr. THOMPSON. Sir? No, sir, I am not going to comment on this.

Senator ELLENDER. All right. Proceed.

Mr. THOMPSON. Our Governor overlooked your invitation to provide material for the State. It was called to his attention some 10 days ago and he designated our water commissioners to prepare such a statement. We got in touch with the Senate select committee and on yesterday, November 30, we received some detailed information as to what you desired. In the meantime we have prepared a statement which I don't think is exactly what you want.

Since we have additional time we will revise it. However, at this time I would like to commend you gentlemen on this committee for taking the leadership in introducing, passing, and serving on this committee that was established by Senate Resolution 48.

I want to say that I think that water is a limiting factor or resource in economic development and agricultural production in the welfare of the entire Nation.

I have just returned some weeks ago from a trip through the West in which we sat down with representatives of the State boards of water engineers, discussing some of the problems that we are running into administratively with our water in Mississippi.

The arid conditions that are found there, the scarcity of water to meet the needs of their people, and the rapid growth of their metropolitan areas, causes me to be even more interested in this field as a result of my trip.

As we look forward to the growth of our country, expecting a population of 250 million people or 50 percent growth by 1980, as we look at the increasing consumption on a per capita basis, of from 600 gallons per person in 1900 to some 1,500 gallons per person to date, we expect this to increase to 1,800 per person by 1980, this would indicate that we will be consuming twice as much water as we are currently consuming as a Nation.

These problems are not identical throughout the United States because of the arid conditions of some areas of the West which contrast with the humid areas of heavy rainfall, similar to what we have in Louisiana and in Mississippi, but our problems are similar, in that water being a limiting factor, our economy and our people are going to have to go to where the resource is or move the resource to them.

Since our water supply is in precipitation, since it is static, since it averages about 30 inches over the United States, and since this ranges from approximately 4 inches in the lowest area to 128 inches in the highest area, this does constitute a tremendous problem. We are going to have to work at it. Otherwise we will all be in the situation that some of our Western States find themselves today. And we will be facing these conditions in the very near future.

It is our opinion that we are already late in starting to develop our water resources for the needs of the future just as some areas have scarcities today.

It is our feeling that an ounce of prevention now will be as valuable as a pound of cure in the future in trying to build impoundments so that we can develop our resources now.

We will prepare a statement for our Governor. It will be submitted within the time allotted.

Thank you very much for this opportunity to be heard.

Senator ELLENDER. All right. Thank you, Mr. Thompson.

The CHAIRMAN. Thank you, Mr. Thompson.

Mr. WIMBERLY. Mr. Glenn G. White, board of directors, Texas Farm Bureau.

Is Mr. White in the room?

Senator ELLENDER. Permission will be given him to file a statement if he desires.

(No further statement will be received from the Texas Farm Bureau.)

Mr. WIMBERLY. Thank you, Mr. Chairman.

Mr. Forrest V. Durand, director of the State Game and Fish Commission, State of Tennessee.

STATEMENT OF FORREST V. DURAND, DIRECTOR, STATE GAME AND FISH COMMISSION, STATE OF TENNESSEE

Mr. DURAND. Senator Kerr and Senator Ellender, I am Forrest V. Durand, director of the Tennessee Game and Fish Commission.

I appreciate very much the honor which I have been accorded in being permitted to appear before this committee and file with you a report from the Tennessee Game and Fish Commission.

I have furnished a statement report and an introductory statement which I will appreciate very much your consideration of including in the record.

Senator ELLENDER. Your full statement will be put in the record.

Mr. DURAND. Thank you, sir.

(The statement follows:)

STATEMENT BY FORREST V. DURAND, DIRECTOR, TENNESSEE GAME AND FISH COMMISSION

The Tennessee Game and Fish Commission has been alert to take advantage of every opportunity to encourage multiple use of the State's water resources. Programs of various Federal and State agencies have tended to create such opportunities. The game and fish commission has, of course, due to its prescribed function of developing game and fish resources, been especially interested in promoting multiple use leading to an increase in such resources and an expanded availability of same. A basic factor is the 475,000 acres of water created in the State by the Tennessee Valley Authority and U.S. Army Corps of Engineer projects. Illustrating the success of this attitude of the game and fish commission is the fact that since 1949 there has been a 32-percent increase in the sale of resident hunting and fishing licenses and a 22-percent increase in nonresident hunting and fishing licenses. This increase has been largely due to the increased use of Tennessee water and wetland resources. Actually, during this period, upland game habitat has decreased to some extent due to the conversion of farmlands to pasture and of small patch-type acreages of agricultural land to clean-cultivated areas.

Fish management practices incident to water resource multiple usage include pioneer development of trout fisheries in the colder tailwaters below dams, use of commercial harvest methods to reduce rough fish, experimental introduction of exotics, and transplanting of native species to new waters within the State. It can now be said without fear of contradiction that Tennessee is one of the great fishing States in the Nation.

Game management practices are primarily the production of desirable waterfowl food in low areas that are subject to natural flooding or can be flooded artificially in connection with large impoundments developed initially for flood control, navigation, and power. Both public shooting and refuge areas have been so developed. As a result, waterfowl in large numbers can now be found where only sparse flocks formerly existed and waterfowl shooting is now a statewide form of recreation.

Despite the success which has attended the game and fish commission's efforts and despite the cooperation of the Tennessee Valley Authority, the U.S. Corps of Engineers, and the U.S. Soil Conservation Service, this cooperative program has been hindered by lack of authority in initial project designs to include sufficient recreational facilities. This in turn stems from a lack of legislative direction and a failure of basic statutes and laws to take into consideration the ever-increasing demand by the general public for recreational facilities.

The members of the select Senate Committee on National Water Resources are therefore urgently petitioned to consider and lend their support toward the development of a broader and more practicable legal basis for multiple use of the natural resource with which they are concerned as members of this committee—a resource which is being subjected to an increased and most varied demand.

With regard to hunting and fishing, it is urged that Federal agencies concerned with the handling of water resources be given authority and directives to include the following specific features in their projects:

1. Tailwater below dams.
   (*a*) Maintain a minimum flow for downstream aquatic life.
   (*b*) Allow for optimum waterflow when special conditions exist for the development of a specialized fishery that necessitates a flow of water above that required for power generation or other primary project requirements.
   (*c*) Consider the placement of intake generator valves for the best use of water in developing tailwater fisheries, for example, in deep reservoirs, to have the intake valve at lower elevation to allow tapping cold water stored that would serve in developing a cold water fishery below the dam.
   (*d*) Include in project plans, fishing pier or platforms for access to tailwaters and construction of same for maximum safety.
2. Reservoir land.
   (*a*) To include areas adjacent to reservoirs of sufficient size that can be developed for game management in conjunction with established pool water level.
   (*b*) Include areas of sufficient size and accessibility that can be developed for camping, picnicking, and fishing access points.
3. Maintenance of conservation pools and reservoirs to preserve recreational value even at periods of extreme drawdown.
4. Authorize the use of water in dewatering areas for seasonal flooding of waterfowl areas.
5. In smaller streams where irrigation may possibly become a factor in streamflow, a minimum flow should be maintained to allow the preservation of aquatic life in shoal areas.
6. Give full consideration to the value of water level manipulation as a tool to increase the productivity of both fish and waterfowl resources.

As indicated above, the principal Federal agencies operating in Tennessee have been most cooperative but in many cases this has been due entirely to personal choice on the part of officials concerned. This, of course, is most particularly appreciated but in some cases these officials have been forced to deviate or give a rather extreme local interpretation to the policies of their organization in order to render the cooperative assistance which has made a very great accomplishment in Tennessee possible. It is believed that in this State as others, an even

greater accomplishment may be expected if the laws bearing upon our water resources could be worded to authorize, encourage, and prescribe multiple use of such resources created regardless of their primary initial purpose.

The above points are listed for the consideration of the members of this select committee and their favorable thought on them is recommended in the national interest.

Mr. DURAND. Water resources constitute an immense factor in the economic life of Tennessee. This is a resource which has been greatly expanded during the past several years through the activities of various Federal agencies, particularly the Tennessee Valley Authority, U.S. Corps of Engineers, and the U.S. Soil Conservation Service. Through the cooperative spirit exhibited by the officials of these organizations, the Tennessee Game and Fish Commission has been enabled to work with them in the development of multiple use of the water resources their programs have created. This has, of course, been principally in the field of game and fish resource development and utilization. We feel that great things in this field have been accomplished in Tennessee, however, even greater accomplishments would have been possible had the basic laws dealing with the programs of these agencies provided and prescribed more specifically a multiple-use approach to the water resources they were enabled to create. There is an increasing demand for this resource's use and there is an increasing demand for its multiple use. I do not feel presumptuous in saying that perhaps this had something to do with your honorable committee's existence.

The brief which I have filed with you sets forth some specific recommendations regarding authorities and directives which the members of this committee are most urgently petitioned to consider in future legislation regarding this matter.

To disregard any possible use of this vital resource which is dwindling when considered in proportion to its required use is a luxury which this Nation cannot afford. I sincerely hope that the items contained in the brief which I have been privileged to present to you as director of the Tennessee Game and Fish Commission may be of some use in your deliberations on this subject.

Gentlemen, the brief which I have given to you in the form of a report sets forth some specific recommendations. It sets forth some specific items which we have been able to do in Tennessee. The recommendations for your consideration are specific enough for application but they are general enough to be included in legislation without a localized connotation.

I thank the committee very much for the privilege of having been permitted to appear before them.

Senator ELLENDER. Thank you very much, Mr. Durand.

Mr. WIMBERLY. Mr. Chairman and members of the committee, this concludes the evidence that has been assembled by the department of public works.

Senator ELLENDER. I wonder if there is anybody else present that would like to be heard?

If not, you may proceed.

Mr. WIMBERLY. We wish to commend you most highly for the efforts you are exerting to solve this problem. We want to thank you and express our appreciation for your holding this meeting and hearing here in Louisiana.

As coordinating authority between the State and the Federal agencies, we wish to assure you that the facilities of our department are at your command.

Thank you very much.

The CHAIRMAN. Thank you, Mr. Wimberly. I would like to say this: This has been one of the finest hearings this committee has been permitted to listen to. It gives evidence of the tremendous amount of work. Papers such as we have had here do not come into existence in any way except by a great mental and physical effort on the part of people. It has been a fine presentation.

I want to congratulate you, Mr. Wimberly, and I believe Mr. Watts helped you, and also Congressman McSween. I especially want to congratulate Senator Ellender.

It is a wonderful experience to see the evidence that exists here of the realization on the part of the people of your State of their great responsibility and the tremendous opportunities that the meeting of that responsibility will create to make available to them.

We leave here with renewed courage and inspiration to continue in this effort, believing that what we have had presented to us here today fully justifies everything that has been done so far as we are concerned in making it possible and convenient for you to give us what you have given us today and being aware of the great work you have done in doing it, I want to not only commend but to congratulate all of you.

Mr. WIMBERLY. Thank you very much.

Senator ELLENDER. Thank you very much, Senator Kerr. I want to say that the part I played in the arrangement was very little. It was more or less in the form of advice. The workhorse of getting all of this together has been Mr. Wimberly and Mr. Calvin Watts.

I wish to also say that my good friend Congressman McSween from this district, the eighth district, has been very helpful in assisting in getting this meeting underway.

I want to congratulate all of you for the fine presentation you have made and I am sure it will be of great benefit to the committee.

If there are no other witnesses to be heard, this will conclude the meeting.

The CHAIRMAN. Senator, I do not believe, and I am sorry I did not do it this morning, I do not believe I presented our staff to this group of people. They are like the people who worked for you in the presentation of this report.

They are doing heroic work.

I would like for Ted Schad, our director, to stand up, and Paul McBride, the chief clerk of our committee.

Mr. Philip Dickinson, representing Senator Engle of California.

Mr. John Mutz, of the Committee on Public Works.

Mr. Doyle Kline representing Senator Anderson of New Mexico.

Miss Muriel Ferris, representing Senator Hart, who sat through most of this hearing and left only when he had to catch a plane.

Mr. Gene Eaton of the Interior and Insular Affairs Committee.

Miss Malvina Stephenson and Miss Ada Lenz, of my staff.

Colonel Kimmett, liaison officer with the Army who makes the arrangements for us to get into town in time for the hearing and out of town in time for the next hearing.

Senator ELLENDER. Thank you very much.

(Whereupon, at 3:20 p.m., December 1, 1959, the hearing adjourned.)

(Subsequent to the close of the hearing the following letter and statements were received:)

LETTER FROM RUSSELL B. LONG, U.S. SENATOR FROM THE STATE OF LOUISIANA

U.S. SENATE,
Washington, D.C., December 29, 1959.

Hon. ROBERT S. KERR,
U.S. Senate,
Washington, D.C.

DEAR BOB: As I mentioned in my letter of November 12, 1959, I regret very much that my absence from Louisiana prevented me from attending the hearing of the Select Committee on National Water Resources in Alexandria, La., on December 1, 1959. I do appreciate your giving me this opportunity to extend my remarks into the record.

Since you were kind enough to make available to me a record of the proceedings at your hearing, I had an opportunity to read what was presented there. It appears to me that the many witnesses who came before you presented a wealth of material that will be of considerable help to you in your work.

Your committee is very much needed at this particular time. It is very much needed to present clearly our long range water needs. These needs cover the fields of water conservation, flood control, and navigation. I hope that, as a result of your deliberations, you will be able to recommend changes to existing law to make it possible for our water development to proceed along more businesslike lines in the future.

Those of us who have had occasion to go back into the history of the development of public works, know that the Corps of Engineers of the U.S. Army was assigned the job of performing navigation maintenance as far back as 1824. We needed flood control work as far back as that, but we could not get Federal approval. For over 100 years, we struggled with the problem without meeting it head-on until the great flood of 1927, when we were forced to admit that flood control is truly a national problem. The lower Mississippi Valley drains 42 percent of the United States; water from many States passes the city of New Orleans. You could hardly expect any one State to assume the tremendous job of effective flood control.

In the days preceding Federal flood control, our levee system was as strong as its weakest link. It was as sound as the financial condition of its poorest member. It is no small wonder that in 1882, we had more than 5 miles of levee crevasses in the State of Louisiana alone. This meant almost total ruin of many crops and the resultant personal loss, as well as the loss to the city, State, and Federal Governments.

Since 1927, we have had no real main line crevasses. The flood control projects have paid for themselves nearly 6 to 1. Since 1927, it has been possible to prosecute flood control and navigation projects side by side. One navigation project in Louisiana has paid off to the ratio of 15 to 1. All of this means

wise investment, conservation of our natural resources, and money in the bank as far as our Federal Government is concerned.

However, just as we had the problem of acceptance of the obligation for 100 years, in recent years we have had another problem. It is becoming increasingly difficult to obtain a favorable economic ratio on a number of projects because of the criteria we have established, and we are practicing pennywise, pound-foolish economy by not making appropriations available when they are needed.

The Federal Government has tremendous buying power because of its size. We are wasting that buying power if we pinch pennies and hold back on money just for the sake of showing a little better balance on the books. We can save that money much more profitably in other ways.

To take an example, a few years ago the Federal Government decided to save money by not maintaining to project dimensions those jobs that had already been completed on our waterways. This is false economy. We must now go back and pay dearly for that so-called economy.

I am very happy that your committee is undertaking this study because we certainly need a reevaluation of our needs at this time. We must bring ourselves up to date. We must overcome the idea that all remaining projects are "marginal" and not worth accomplishing. We must take a good, realistic look at our water needs and lay the groundwork to accomplish these needs—even if it costs money, for that is money that is returned to us manifold.

Much of the wealth of America depends upon its waterways. We need those waterways and we need them developed to their fullest.

This is the message I would have presented if I had been at your hearing in Alexandria. I will appreciate it very much if you will add it to your record and if you will call upon me at any time you find I can be of some assistance in accomplishing these objectives.

With every good wish for the success of your committee, I am,

Sincerely yours,

RUSSELL.

STATEMENT BY CARL O. BOLTON, PRESIDENT, TENNESSEE CONSERVATION LEAGUE

The Tennessee Conservation League has had the privilege of observing the progress of the national conservation effort over the past decade and appreciates the recognition rendered to some of our most urgent problems. The increased Federal grants to municipal sewage treatment works construction program, the legal consideration to wildlife and recreation in water development projects provided in the Fish and Wildlife Coordination Act, the provision for Federal cost sharing for fish and wildlife development in the Watershed Protection and Flood Prevention Act, and the passage of the Federal Boating Act to provide safety on our great lakes of the South.

Our experience as recreationists enjoying the wealth of water impounded for flood control, power and navigation by the Tennessee Valley Authority and the U.S. Army Corps of Engineers has made us aware of possibilities for improving such projects in the future.

In appreciation for what we now enjoy we commend the Tennessee Valley Authority for their pioneer effort in multipurpose project design in anticipating public use as a project purpose.

We recommend the following considerations in the future development of water resource projects with regard to hunting and fishing. It is urged that Federal agencies concerned with the handling of water resources be given authority and directives to include the following specific features in their projects:

1. Tailwater below dams.

(*a*) Maintain a minimum flow for downstream aquatic life.

(*b*) Allow for optimum water flow when special conditions exist for the development of a specialized fishery that necessitates a flow of water above that required for power generation or other primary project requirements.

(*c*) Consider the placement of intake generator valves for the best use of water in developing tailwater fisheries, for example, in deep reservoirs, to have the intake valve at lower elevation to allow tapping cold water stored that would serve in developing a cold water fishery below the dam.

(*d*) Include in project plans, fishing piers or platforms for access to tailwaters and construction of same for maximum safety.

2. Reservoir land.

(*a*) To include areas adjacent to reservoirs of sufficient size that can be developed for game management in conjunction with established pool water level.

(*b*) Include areas of sufficient size and accessibility that can be developed for camping, picnicking and fishing access points.

3. Maintenance of conservation pools and reservoirs to preserve recreational value even at periods of extreme drawdown.

4. Authorize the use of water in dewatering areas for seasonal flooding of waterfowl areas.

5. In smaller streams where irrigation may possibly become a factor in streamflow, a minimum flow should be maintained to allow the preservation of aquatic life in shoal areas.

6. Give full consideration to the value of water level manipulation as a tool to increase the productivity of both fish and waterfowl resources.

We further recommend a critical review of existing water development projects for the purpose of finding ways and means of allocating funds to acquire land for additional recreational facilities and to review the operation of present projects for possible modification to serve recreational purposes.

We assume that this committee is sufficiently versed on the economic value of recreation and the other factors that allow us to enjoy the recreational wealth of our water resources, and we therefore feel that a summation of these values is unnecessary.

STATEMENT BY A. ADLER HIRSCH, WATER PURIFICATION SUPERINTENDENT, DEPARTMENT OF WATER AND SEWERAGE, SHREVEPORT, LA.

Since the object of your committee is to consider the developing crises, circa 1980, in water resources and recommend to the Congress various means to alleviate their impact in advance of occurrence, the following personal observations are submitted as partial solutions.

Most of these statements have particular reference to public and industrial water supply needs, the former especially having the predominant priority on water usage as compared to other applications and aspects.

FULLEST UTILIZATION OF STORAGE SITES

To insure sufficient water for consumptive uses in the face of ever-increasing demands, the inventory of available volume must be increased. Inasmuch as underground water is diminishing in supply and no way has been yet developed for massive recharge of aquifers, the only only alternative applicable on a major scale is the construction of more and larger reservoirs for storage of surface water during flush flows. Unfortunately there is a dearth of good sites possessing the essentials for reservoir location. Nevertheless, a network of reservoirs will ultimately dot the Nation. Beyond this, the standard of living and development as we know it now will have reached its limit; it will next depend on the technology of reclamation and reuse of waste waters, which would yield a second-rate source, quantitatively and qualitatively.

Before full utilization of climate and terraine can be realized various barriers must be surmounted. Only two are discused here, but there are others which are well known.

OBJECTIONS OF INDIGENOUS INDUSTRY

Much of the objection against dedication of large areas for water storage is voiced by local agricultural interests, such as farmers and lumbermen. There is still much arable land which can be developed, particularly with irrigation, chemical fertilizers, and soil conditioners. Therefore farmers may be relocated upon fair payment for expropriation and one for resettlement difficulties. In contrast, as noted previously, ideal storage reservoir sites are few.

The lumber industry is particularly vociferous on the diversion of timberland to water storage purposes. They refuse to realize the blunt reality that there

wise investment, conservation of our natural resources, and money in the bank as far as our Federal Government is concerned.

However, just as we had the problem of acceptance of the obligation for 100 years, in recent years we have had another problem. It is becoming increasingly difficult to obtain a favorable economic ratio on a number of projects because of the criteria we have established, and we are practicing pennywise, pound-foolish economy by not making appropriations available when they are needed.

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The lumber industry is particularly vociferous on the diversion of timberland to water storage purposes. They refuse to realize the blunt reality that there

is no substitute for water, whereas substitutes and alternatives for lumber appear on the market in increasing numbers. Furthermore, tree farms under professional management may be made to yield sufficient lumber for our national needs, rather than depend on the random growth in a natural forest.

Furthermore, the lumber industry especially in its earlier days, was notorious for its profligate waste; of all industries it should definitely not be the one to dictate the pattern for wastage now of our too few available water storage sites.

A particular instance of self-centered demands of lumber interests in that of the proposed Millwood Dam and Reservoir in the Little River Basin of southwestern Arkansas. This is primarily a flood control reservoir, but could be utilized for other purposes in addition, especially as a means, as explained later, to improve the quality of Red River water. Insistence of lumbermen has had the size of the project reduced one-quarter, with the volume transferred to reservoirs on headwater streams. There the flood control value is cut materially; also the storage of sufficient water for dilution of the Red River flow is prevented. The water resources and growth potential of a basin should not be reducible by pressure from a single economic group.

MAUDLIN SYMPATHY FOR DISPLACED PERSONS

There is a sentiment noticed even in flood control circles against the displacement of local residents whenever a large project for the general good requires their removal. Newspapers and magazines play up the popular sympathy against leaving the old homestead to their willing readers. Such sentimentalists fail to realize or point out that virtual displacements have been going on since time immemorial. Every time a man takes a job in another city and moves his home, he is undergoing the same sort of displacement. This happens millions of times, with some degree of personal hardship but nothing said on a large scale. But, for the good of a whole valley, let a few families get paid to leave behind their farm and resettle elsewhere, and there is a chorus of wails.

INTRODUCTION OF QUALITY IMPROVEMENT STORAGE

In the semiarid Southwest, the streams are highly mineralized, but as they flow eastward and south, their tributaries feed in larger and larger amounts of greatly improved water. Especially during floodtime is the quality at its best; however, this water, for the most part is discharged from existent flood control reservoirs so that the complete flood control pool is available for the next storm. If there were provided a portion of the impoundment dedicated specifically to the retention of dilution water for managed release during dry seasons, the water quality in the whole basin below would be improved.

Thus, a study just completed by the writer shows that a 161,500 acre-feet increment for dilution water storage, distributed between the various remaining flood control reservoirs in prospect for construction in the Red River Valley below Denison Dam, would keep the salt concentration of Red River water below the U.S. Public Health standard for chlorides in potable water, even during the severe drought year of 1955. The size of the dilution pool is relatively small and will add only slightly to the overall cost of the project. This facility would enable widespread municipal water supply withdrawals along the middle and lower reaches of Red River and tremendously enhance the whole economy of the valley.

In this way another benefit could be attached to either a single purpose of multifunction reservoir to reclaim for productive use the yield of a major stream otherwise, through poor quality, wastefully flowing to the sea. For Red River an annual average of 18 million acre-feet would be available for users below the Arkansas line. The inventory of usable water reclaimable for the Arkansas River has not as yet, so far as the writer knows, been ascertained but it should be expected to exceed the previous figure very impressively.

OUTLAWRY OF DESPOILMENT BY OIL FIELD BRINES

Much of our natural water in the States possessing heavy oil production is being polluted by disposal of the salt water associated with the crude. Wherever these brines have been released, or attempts made to retain them by sur-

face means, the drainage from the area has become highly saline. It is now realized in conservation circles that the only really effective means for brine disposal is by injection underground either to the producing formation or to another receiving strata below the fresh water horizon.

As an example of salt water pollution, the average sodium chloride concentration in Cross Lake, the source of the Shreveport municipal supply, has jumped from about 20 parts per million in 1952 to over 100 parts per million in 1959, most of this rise being in the last several years, as a result of an increase in the number of producing oil wells.

As oil production expands, the attendant salt water pollution poses growing problems to the quality of our water resources. Eventually the price of gasoline must bear a one-half to 1 cent added cost to finance the expense of waste disposal associated with its production.

OTHER AIDS

A few other helpful moves to preserve our water resources will be briefly mentioned without further elaboration:

(*a*) Publication of a Federal water resources bulletin.

(*b*) Federal aid to research or application of cloud seeding and evaporation control.

(*c*) Federal and State aid to colleges or universities to maintain continuing data collection or studies on the hydrology, chemistry, and biology of closeby surface water bodies. Similar aid for ground water studies should be offered where desirable.

(*d*) Subsidize part of education, undergraduate or post graduate, of individuals capable of accomplishment in this field, provided they contract for suitable period of service in some significant aspects of water development or conservancy. An analogous system is already in use in the medical services.

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